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# THE SPOKEN LANGUAGE OF THE BLIND PRESCHOOL CHILD:

## A Study of Method

BY
KATHRYN ERROLL MAXFIELD, PH.D.

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ARCHIVES OF PSYCHOLOGY
R. S. WOODWORTH, EDITOR
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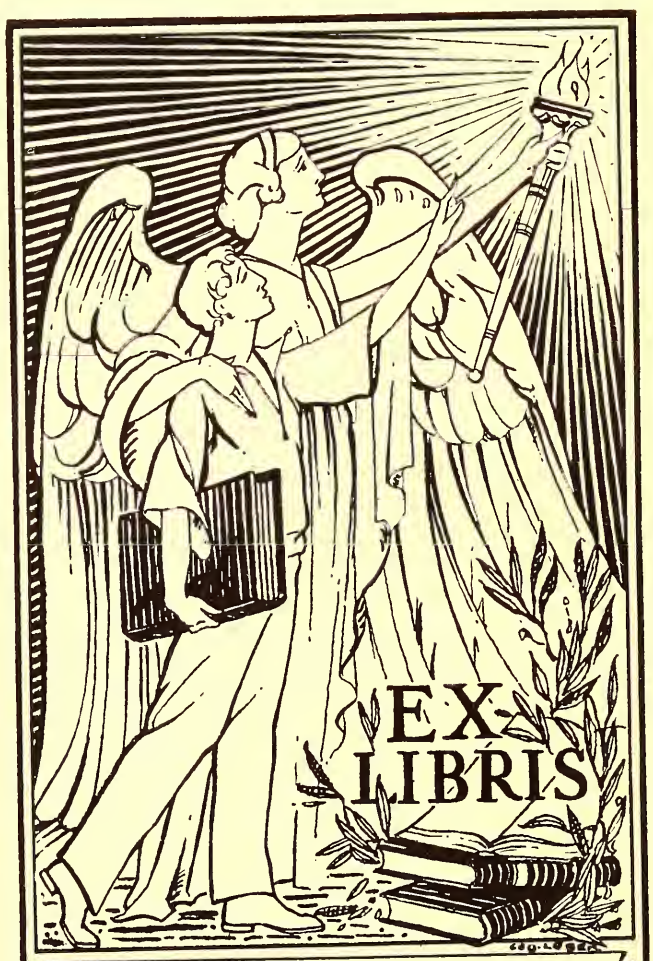

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KATHRYN ERROLL MAXFIELD

April, 1936.

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# The Spoken Language of the Blind Pre-School Child: A Study of Method

## I. INTRODUCTION

For the adult who has been blind from early infancy life's whole pattern has been affected by the type of training he received during his preschool years. Sometimes through ignorance, sometimes through unavoidable illness, the development of blind and low-visioned babies is often neglected until they have reached the age of two or even three. Because proper incentives to mental growth are not given them during these important first months of life they sink into a state of vegetative inertia, a kind of physical and mental lassitude, which they find eminently satisfying, if one can judge by the tenacity with which they resist efforts to stimulate them to constructive activity. True mental growth is retarded for a dangerously long time, from the point of view of the child's normal adjustment to life as a pupil and as an adult.

In the few instances where visually-handicapped babies have been given proper training from the beginning they seem to show little retardation in learning to walk and talk, when compared with seeing children of corresponding mental ability. However, the best training available at present is still inadequate to the needs of preschool blind and low-visioned children because so little is known about those things which have special appeal to a child without sight and about those things the meanings of which may be quite different for the blind child from what they are for the seeing adult. The difficulties inherent in psychological research with this particular group of children are thrown into relief by the following quotations from Cutsforth's book, *The Blind in School and Society:* (8)

"The most objective sort of human experience is visual experience. It gives detail which no other sense can provide; at the same time it brings objects into simultaneous relations of position, distance, size, and form. Although the normal seeing infant perceives spatial relations at first to a very imperfect degree, he begins early to construct a visual space world, and the objectivity thus visually achieved lends form and place to what is heard and touched. An immotile infant who lacks the objectivity that vision gives is utterly unable to organize sound patterns of spatial extent, direction, or location. Sound experience lacks these qualities in the congenitally

blind infant until he is able to establish them through motor activity, that is, until he is able to creep or walk about."

"During the busy waking hours, while the seeing infant is visually inspecting and becoming acquainted with the objective world by watching the movement of forms about him, the blind child is aware of nothing, objectively, outside the arcs described by his unsteady hands and feet. He rapidly learns to recognize voices and personal contacts, but the voices come out of nothingness and return to nothingness when they cease. While the normal child's life develops to include an ever-widening range of objective stimulation, the blind child must find his only stimulation within bodily reach. From this time on he constitutes the greatest part of his own environment. He finds in himself the stimulation and motivation to action that the seeing child finds in the visually objective environment."

Meaningful speech does not grow in such sterile soil; it must be well-rooted in the ground of constructive experience with the objective and the concrete before it will thrive. Since the language of the blind or low-visioned child must have its inception in whatever experiences and developmental opportunities have come his way during his first years of life, it is important that we learn more about his special needs at this age-level. Language, both implicit and expressed, can be an invaluable instrument in the adjustment of the visually-handicapped to life among the seeing.

There seem to be two crucial stages in the language growth of the blind or low-visioned child before he reaches school age. The first is during his pre-language period when he lacks the incentives to speak which come from visual imitation and from the understanding of gestures. However, after he has begun using single words and simple sentences he may remain indefinitely in this stage of language development unless a constantly enriched and stimulating environmental experience is provided him. Of what this experience should consist is known only in a general way. The second crucial stage covers the years from three through six, approximately. Unless the visually-handicapped child has obtained an adequate control over the structure of language during these years, he has not at his command one of the most valuable instruments for the acquisition not only of the services of those about him, their ideas and their experiences, but also of their friendship and respect. Neither is he well prepared for his introduction to formal education.

So far as can be discovered only one study has been made on the development of language in a blind child under school age. This was by Dr. C. H. Bean on the development of speech in his own child who was blind until 16 months of age, at which time he was operated upon for congenital cataracts. (4)

In 1933, with the collaboration of parents and of workers for the blind, a study was made by the present author for the purpose of discovering trends which would serve as a guide to experimental work in the future. (18) The only contribution to an understanding of the language growth of visually-handicapped preschool children was the finding that the totally blind of an educable degree of mentality were seriously delayed in speech development, and that children with a sight-saving degree of vision were less likely to be reported as retarded in this respect. One other study has been made which followed the development of vocabulary in a deaf-blind child during his first two years in school, but it has nothing to contribute to our present problem. (17) Although studies on the extent of vocabulary have no direct bearing here, nevertheless, it is interesting to note that in his adaptation of the Terman-Binet Test, Hayes found it necessary to require fewer words in the vocabulary test even at the superior adult level. (15)

The chief reason for the lack of experimental work on blind and low-visioned children under school age lies in the difficulties encountered in this field. Visually-handicapped children at any age-level form a heterogeneous group of subjects, experimentally speaking, but this is particularly true of the infants and preschool children. They vary among themselves not only in the more usual characteristics of age, sex, race, nationality, and socio-economic status; they differ also with regard to their degree of vision, the age at which vision was lost, the cause and type of visual defect, frequency and length of illnesses and hospitalization, and degree of mentality. Among these children there is a high percentage of serious additional handicaps such as unusual organic conditions resulting in behavior problems. (18)

Such diversity among so few subject means that limited validity can be expected from cross-sectional studies on whatever children may be available at a given time. There is a growing conviction that adequate data can be obtained only through carefully planned, well integrated, longitudinal studies covering a period of years. A few such studies would form a core about which supplementary studies, both longitudinal and cross-sectional, could be grouped so that some day a useful body of knowledge would emerge. They

would make possible the assemblage of all records obtained over a period of years on children having similar characteristics, such as the type of eye defect, the number of months of neglect after birth, or the relationship between cause of blindness and cause of behavior problems. In following the development of a few individual children we should have evidence at last which would be of sufficient validity for use in planning the training of visually-handicapped children not only during their preschool years but during their careers in kindergarten and the primary grades.

Theoretically, a longitudinal study of language growth in the blind and low-visioned preschool child should begin with the pre-language period in order to find the reasons for excessive delay in speech development. However, since we have not been able to devise adequate procedures for studying the visually-handicapped child's language at this early age-level, work on this first stage must be postponed. Therefore, it is planned to begin the studies on language with approximately the third birthday and to continue them until the seventh. If it proves possible to follow some of the children for a longer period of time the studies will be extended. One study will have to do with vocabulary growth and another with the richness and variety of the mental content shown by these children in their imaginative play and in their story-telling. In this investigation, we are concerned with the study of the functional and structural status of spoken language during the preschool years.

Before proceeding to a discussion of this problem it may be helpful to explain some of the terms regarding vision which will be used frequently. Among young children with defective sight, and especially among those under school age, it is often impossible to do more than hazard a guess at the actual degree of vision which exists. The child who is totally blind is usually recognized as such, although even then it is sometimes impossible to tell whether there is a slight degree of light perception. With the children who have so much vision that they are prospective candidates for sight-saving classes it is not hard to label them partially-seeing rather than blind. For the in-between group, however, those who are called *low-visioned* here but who are sometimes designated as *educationally blind,* it is often not possible to judge the amount and character of their sight. The term *visually-handicapped* in its more general sense applies to all those whose degree of sight is sufficiently limited so that it constitutes a handicap. In this study, for the purpose of simplifying terminology, the term will be used to cover the blind and low-visioned.

# II. THE PROBLEM

## GENERAL NATURE OF THE PROBLEM

There is under consideration a longitudinal investigation into the language development of preschool visually-handicapped children in its functional and structural aspects; that is, in the use which the child makes of language not only to express himself but to evoke responses in others, and in the indication which he gives of increasing skill in the handling of language as a tool. It is thought that such a study will reveal distinguishing characteristics not only between the blind and the seeing, but between the visually-handicapped having different degrees and causes of blindness, different additional disabilities, and so forth.

Already attention has been called to the fact that very few blind and low-visioned children are available for study at any one time, and that there is a considerable diversity among even these. It is this which has persuaded the author that genuinely contributive information on the developmental characteristics of such a small and heterogeneous group can be obtained only through longitudinal studies.

However, even if enough subjects were available to justify the statistical treatment of a cross-sectional study, a longitudinal investigation would still be advisable in order that individual differences in directions, rates, and periods of growth might be given full consideration. Yet the course of such investigations will need checking occasionally by comparison with a cross-sectional study, however limited the data for such a study may be.

Furthermore, preparatory to a longitudinal study it is necessary, by means of a cross-sectional study, to pick out those methods which give promise of working. Four general criteria must be kept in mind in the choice of methods. First, they should be selected from those which have already attained some authority through use by competent investigators into the language development of seeing children. Such a selection would carry weight with other workers who might become interested in this topic, and also would make possible comparison of the results obtained on the blind with those obtained by the same investigators or by others on the seeing. Next, it is necessary to make sure that these methods can be used on blind subjects without changes in technique. Further, it is necessary to eliminate procedures which do not distinguish individual differ-

ences among the visually-handicapped themselves. And last, the chosen methods must be as objective as possible in order that they may be used with profit by other experimenters.

### SPECIFIC PROBLEMS

*The task of this cross-sectional study, therefore, lies in the choice, for use in future work, of a group of items relating to the functional and structural use of spoken language by the blind preschool child, and of methods which will meet the four criteria just stated.*

This study has made it possible to pick out items and procedures which give considerable promise, has indicated others which should be kept tentatively, and has made it possible to eliminate those which offer little or nothing.

The collection and treatment of the material is considered more fully in Section IV. Here, it is sufficient to say that the original data were obtained through verbatim reports of the children's spontaneous language during free play; that the original notes were transferred as soon as possible to typed record-sheets; that a system of classification has been devised which makes possible the study of the different groups of items. The records were an hour in length (except for one 50-minute record) and were obtained on eight totally blind children varying in intelligence from low average to very superior.

For long-term investigations in nearly unexplored fields an attempt to formulate hypotheses would seem to be unwise. The establishment of an hypothesis can lead to a *justifying* attitude of mind rather than to an *interrogating* one. For this reason, the present problem is expressed by four groups of questions covering (a) the child's functional use of language, (b) social indices to be found in his language, (c) the constructional nature of his speech, and (d) special features which may be of particular importance for the visually-handicapped child.

The questions given below are arranged in the order in which they have been treated in the study. In the Conclusion they will be found arranged according to whether or not they give sufficient promise to warrant their continuance for future work.

### QUESTIONS

A. Functional Analysis

1. What percentage of the child's remarks is about himself?
2. What percentage of his remarks is about other persons?

3. What percentage is about things?
4. What is the child's interest in himself as compared with his interest in other persons and objects—his degree of egocentricity?
5. What percentage of his total speech is composed of questions?
6. How much does he indulge in commands, whether to himself, to other persons, or to things?
7. How much of his language consists of statements?
8. How much interest does he show in dramatic imitation?
9. How much word play does he indulge in?
10. How much exact repetition does he use of what he himself says?

B. Social Indices

1. How much of the child's speech consists of emotionally-toned responses?
2. What indication does his speech give regarding his negativism?
   a. Does his use of negative statements and of *No* answer this question?
3. How much does he use the names of children and adults?
4. What tendency does he show toward sharing his experiences with others?
   a. Does his use of *we, us,* and *our* answer this question?

C. Sentence Construction

1. What proportion of the child's remarks is complete, what incomplete, and what non-verbal?
2. In his incomplete sentences what are the omissions?
3. How much does he indulge in exact repetition of whole remarks?
4. What about the complexity of his sentence structure?
5. How do his responses compare in length with those of seeing children?
6. What is his range of vocabulary as compared with his general loquacity; that is, the ratio of the number of different words he uses to his total number of words?
7. What is the percentage of the different parts of speech in his total number of words and in his different words?

D. Special Questions

1. What is the child's use of sensory terms?
   a. Does he have a tendency toward using the terminology of the seeing?

2. What use does he make of spatial and temporal terms?
3. Does an analysis of the child's activity terms indicate anything significant?
4. Does his use of conjunctions and adverbs indicate anything?
5. Are there evidences of inhibiting factors, such as fears, which might interfere with personality or speech development?

DISCUSSION

On most of these questions more or less comparable data of fair validity can be found for the seeing child, especially in the work of Smith (26) (27) (28), McCarthy (20), and Fisher (12). The majority of the questions have been posited because it seemed likely that their answers would have something valuable to offer toward a better understanding of the blind child's language usage in comparison with that of the seeing child, and of the differences to be found among visually-handicapped children themselves. The questions in the group headed *special questions,* as well as a few of the others, have been included hopefully on the chance that they would throw some light on the special language problems of this particular group of children.

This cross-sectional study seems to have given what was wanted; that is, a promising schedule of questions and procedures to be used by the author and her coworkers in the longitudinal study of the development of spoken language in preschool visually-handicapped children, a study which will some day disclose those much needed clues to the differences between the blind and the seeing and between the visually-handicapped themselves.

## III. PERTINENT STUDIES ON THE SEEING PRESCHOOL CHILD

Dr. Mary Shattuck Fisher has made a study of the language of seeing children upon which this investigation leans heavily (12). Her chief interest lay in an "attempt to develop an objective technique for the analysis of language records of preschool children, a technique which will indicate social implications and personality differences at the same time that it reveals developmental patterns or progressive stages through which school children pass in gaining linguistic control."

Her underlying assumption seems especially useful for this study:

"After further preliminary and experimental analysis I became convinced that grammatical form, quite regardless of the thought content, would reveal the various stages through which children pass in gaining linguistic control, as well as certain social implications of gain in language control. The underlying hypothesis is as follows: Each culture has developed standardized patterns of speech which have become a part of the social behavior of its people. Whatever may be true of casual conversation, it is hardly to be questioned that the complete and skillful expression which is the highest development of language generally implies completeness of grammatical construction. It seems reasonable, therefore, to consider increased control over the sentence one indication of increased control over language. That it is not the only indication is obvious; that it is not the most significant is possible. It has, however, the advantage of objectivity."

Fisher used the verbatim-report form of the observational method. The reports were taken by trained stenographers on three mornings within approximately one week, and covered about nine hours for each child. The stenographers set down not only all of the observed child's speech but as much of the general situation as could be noted. The time and places were recorded, as well as changes made in the place during the course of the observation. The original shorthand notes were transferred immediately to record sheets. Through the courtesy of Dr. Fisher we have been able to use the same blanks. (See Appendix Two.)

Fisher took the sentence as the unit and the subject of the sentence as the indicator of the child's functional use of language.

She treats her data under three headings, *functional analysis, construction analysis, and social indices.*

Under *functional analysis* she has three categories—Category I., in which are placed all the sentences having the self as subject; Category II., in which are the sentences having another person as subject, and Category III., in which are the sentences having a thing as subject. This last category includes also all partial sentences, phrases, or single words which do not relate clearly to the self or to another person. A Coefficient of Egocentricity is obtained by dividing Category I. by the sum of Categories II. and III. Although this coefficient was figured on an entirely different basis from that of Piaget, Fisher was interested to see if there would be any similarity between their results. Piaget obtained his Coefficient of Egocentricity by dividing his three Categories of Egocentric Speech into the sum of the first seven of his eight categories.

Non-verbal remarks, although included in the sum total of remarks whenever the percentage of total responses is wanted, are not included when obtaining percentages for the three categories.

Under *functional analysis* Fisher includes Questions and Commands, also, and she finds the percentage of each in the total number of remarks.

In *construction analysis,* she concerns herself primarily with those "language patterns of preschool children inherent in the *proportions* of speech which tend to be non-verbal, exact repetition, incomplete or complete sentences at the different age-levels." The complete sentences are analyzed into simple, compound, complex, compound-complex.

The following are grouped under *social indices:* (a) average remarks per hour, (b) use of negative sentences and *No* as indications of negativism, (c) the use of *we, us,* and *our,* and (d) the average number of times per hour that children and adults were named.

Throughout the study Fisher has recorded sex differences as well as age differences.

The one drawback in the use of this study as the chief basis of comparison for our own work lies in the fact that Fisher's children were a superior group not only in general intelligence but in social background, whereas any study of physically-handicapped children will run the gamut in social background and will cover the distribution curve in general intelligence, except for that portion represent-

ing the definitely feebleminded. However, this is a shortcoming shared by most studies on preschool children.

Dr. Fisher checked carefully the reliability of her work. A record was not used if it was taken while the child was exhibiting unusual behavior, such as a prolonged crying spell. All of the records were made in the same environment. The stenographers who did the recording were given an initial period of training in order that not only their accuracy might be checked but also their ability to observe so unobtrusively that the children were not conscious of their presence. Since it is nearly impossible to record every single word uttered by a very young child, the nine hours of observation were decided upon so that any lost responses would be negligible in their effect. As the result of her experience with these long records, however, Dr. Fisher feels that much shorter ones would be satisfactory for any study dealing primarily with the *use* of language. It may be that preschool children cover the range of their functional and structural use of language in periods of from twenty minutes to half an hour, and if this is so three such periods should furnish valid data. However, before the best length of period is known there is need for further work on just this phase of technique.

Fisher's method of scoring the data, not in terms of what the child meant or felt by what he said, as did Piaget, but by the grammatical form of his responses, increases the objectivity of her work. It makes possible the use of her method by any "grammar-conscious" adult. In order to check this assumption Fisher had five graduate students analyze the same five pages of one child's record, the pages being chosen at random. The percentages of agreement among the pairs of recorders were high, only two falling below 85. Two of the recorders were not "grammar-conscious"; otherwise, the per cents would have been even higher. The need is patent for making sure that scorers are reasonably well versed in the rules of grammar.

In three records that were rechecked by Dr. Fisher herself after an interval of several months the self-agreement was 97%. There were no discrepancies in the more important items.

Compared with the possibilities for subjective errors in Piaget's method of scoring, Fisher's seems to indicate a reasonably reliable method of procedure for use in any long-term study during the course of which there may be a number of different recorders and scorers.

In 1929 Dr. Dorothea McCarthy conducted an investigation (20) in which she gave consideration to the following aspects of the language problem:

1. The function of language in the child's life.
2. The changes in the length of sentences.
3. Complexity of sentence structure.
4. The proportion of the various parts of speech that occurred in the material obtained.

Dr. McCarthy thought it preferable to make constant the situation and the number of responses rather than the time interval. Consequently, she tested the children in their own homes, using pictures and toys to arouse 50 consecutive responses. The situation was definitely that of child-adult. Whenever possible, the examiner was alone in the room with the child. The 50 responses were taken down exactly as they sounded to the examiner, with the occasional help of a member of the family in interpreting.

In organizing the functional aspects of her data she followed a modification of Piaget's procedure. Since her records were on much younger subjects than Piaget's it was necessary for her to divide the responses into those which were comprehensible, semicomprehensible, and incomprehensible. The comprehensible responses she analyzed according to the following categories:

A. Egocentric speech.
    1. Repetition, or echolalia.
    2. Monologue.
    3. Dual or collective monologue.
B. Socialized speech.
    1. Adapted information.
        a. Naming.
        b. Remarks about the immediate situation.
        c. Remarks associated with the situation.
        d. Irrelevant remarks.
    2. Criticism.
    3. Emotionally-toned responses.
    4. Questions.
    5. Answers.
    6. Social phrases.
    7. Dramatic imitation.

McCarthy's treatment of *egocentric speech* is identical with that of Piaget. Under *repetition,* or *echolalia,* are included "repetition

of words and syllables . . . for the pleasure of talking, with no thought of talking to anyone, nor even at times of saying words that will make sense." *Monologue* indicates that the child is talking to himself as though he were thinking aloud without paying attention to any one near him. In *dual* or *collective monologue,* "an outsider is always associated with the action or thought of the moment but is expected neither to hear nor to understand. The point of view of the hearer is never taken into account. His presence serves only as a stimulus. . . . The child talks about himself without collaboration with his audience or without evoking a dialogue."

Under *socialized speech* McCarthy has analyzed *adapted information* in more detail than did Piaget, as is indicated by the subheadings *a* through *d*. *Adapted information* occurs when the child really "exchanges his thoughts with others, either by telling him something that will interest him, influence his actions, or by actual interchange of ideas." Piaget limited *criticism* to "all remarks about the work or behavior of others, but having the same character as *adapted information.*" McCarthy extended this to include "criticisms of objects as well as that of persons and also complaints about situations in which the child is thwarted."

Piaget's third group under *socialized speech* includes *commands, requests,* and *threats.* In McCarthy's study, however, this group is enlarged to cover all *emotionally-toned responses,* including single-word sentences having an obvious emotional tone.

The next group under *socialized speech* consists of *questions,* by which are meant real interrogative sentences with an interrogative function, *i.e.,* any remark that definitely requires an answer from the hearer. In the fifth group are all *answers* to real questions and commands, in Piaget's study. McCarthy has broadened this to include all elicited responses, although she has put under *adapted information* those responses which are answers to remarks that are not questions.

Two groups, *social phrases* and *dramatic imitation* have been added by McCarthy.

Her *construction analysis* is outlined as follows:

A. Complete responses
   1. Functionally complete but structurally incomplete responses.
   2. Simple sentences without a phrase
   3. Simple sentences with a phrase

4. Compound sentences
5. Complex sentences
6. Elaborated sentences

B. Incomplete Responses
1. Omission of the verb
2. Omission of the subject
3. Omission of a preposition
4. Omission of a conjunction
5. Omission of the verb and the subject
6. Miscellaneous omissions (itemized)

Under *elaborated sentences* McCarthy has put the long, involved sentences sometimes used by the children which were "much more complex and seemed to indicate a higher stage of linguistic development than the ordinary compound and complex sentences, which, in some cases, may be quite short."

One chapter in McCarthy's investigation is devoted to a quantitative analysis of her data according to length of response. The comprehensible responses are scored according to the *number of words per response,* and the semicomprehensible and incomprehensible were scored according to the *number of syllables combined per response.* In order to standardize the procedure regarding what is or is not a word, the following set of rules was formulated:

1. Contractions of the subject and predicate like "it's," "we're," "you're," etc., were scored as two words. In such cases the child speaks correctly according to adult conversational usage, which really is his only model of correct speech. Each part of a contraction is an essential part of the sentence, and if the sentence is to be considered complete, it is necessary to recognize these two parts. In order, therefore, to make the analysis according to the length of response consistent with the later analysis according to the construction of the response, it seems justifiable to score such constructions as two separate words.

2. Contractions of the verb and the negative like "can't," "won't," etc., were scored as single words. The child who has no knowledge of how words are written does not know that "can't" is a contraction of "can" and "not." He hears "can" as one word and "can't" as another; they have different meanings and hence are probably two distinct and independent words to the child.

3. Hyphenated words and compound nouns, particularly proper nouns, which are not hyphenated, but which probably function as single words and as names of single objects, were scored as one word. For example, "merry-go-round," "Mother Goose," "Betty Lou," and such expressions were scored as single words.

4. Each part of a verbal combination was scored as a separate word. For example, "have been playing" counted as three words.

5. "Lookit," which occurs frequently, was scored as one word if it was used alone and functioned simply as "look." If, however, it was followed by an object, it was counted as two words, "look at."

"The frequency of occurrence of each word was found as well as the total number of words, the total number of different words, and the percentage of each part of speech used at each age-level."

McCarthy had twenty children at seven age-levels, 18, 24, 30, 36, 42, 48, 54 months, making a total of a hundred and forty subjects. Each child was observed within a month and a half of the age at which he was classified. In this way the age factor was standardized sufficiently.

The reliability of the children's responses was checked by correlating the odd- with the even-numbered responses, correcting the coefficient by the use of the Spearman-Brown formula, and coefficients above .85 were obtained except where there was a low frequency of the items, whether for the group as a whole or at certain age-levels.

To check the distribution by the scorer of the responses among the categories, three additional people scored 10% of the records independently, these records being chosen at random from each of the seven age-levels. There was fairly close agreement among the four scorers. To quote from McCarthy, "The mean of the correlations for each scorer with each of the others on all the items combined was: Scorer A, +.83; Scorer B, +.84; Scorer C, +.79; Scorer D, +.81. This method probably could be improved with respect to this type of reliability by a few changes in the definitions, by way of making them more definite and more objective. This test has served merely as a preliminary indicator which shows that the method is reliable enough for use with groups, and in some instances meets Kelley's criterion for individual predictions (.90)."

It did not seem practicable to follow McCarthy's procedure in the collection of the data for two reasons. First, among blind and low-visioned preschool children those who refuse to cooperate in any

set adult-child situation are not unusual. Second, too little is known at present regarding play materials which can be depended upon to arouse interest and speech in blind children at this age-level. Consequently, any materials which were substituted for those used by McCarthy might prove useful with a few children and useless with many others.

Although we could not use McCarthy's method for collecting data we did follow partly her method of treating them. Dr. McCarthy's book contains a brief but excellent summary of language studies made before 1929. The last chapter discusses theories of language and its function, relating her own study to this theoretical background.

In 1926 Dr. Madorah Smith made a study which was based on verbatim reports of the spontaneous conversation of preschool children (27). The larger portion of it was concerned with the development of a test of vocabulary extent. One chapter, however, had to do with the Development of the Sentence in Children from Two to Five. Most of her one hundred and twenty-four records were an hour in length, although a few were longer. Only one child's conversation at a time was recorded unless two children who talked little played together so much that it was possible to record for both at once. By using a system of abbreviations, Smith lost very few words or sentences in the process of transcribing, even for the fluent speakers. She took all but two of the records herself, and these two were made by the child's mother under similar conditions.

Most of the children studied were from the Preschool Laboratory of the Iowa Child Welfare Station, the Home of the Friendless, and the Day Nursery of the Cedar Rapids Sunshine Mission. This would seem to insure a reasonably good cross section of the population. However, the average IQ's for the different age-groups, on the Stanford-Binet Test, ranged from 105 to 109. This tendency toward IQ's above 100 in what was supposed to be a representative sampling of the population, was found by McCarthy as well. In her group the average IQ's ranged from 103.3 to 112 on the Kuhlmann Revision of the Binet Test. It is apparent that some selective factor was present, such as the caliber of parents who would be willing to cooperate on such an experiment.

Smith analyzed her responses according to the average length of sentence; the average number of all words used; and the average number of different words. The ratios of the different words used to the total number of words were calculated for children two, three, four, and five years old. (She places in any one age-group all

children within six months of their birthdays; for example, age two includes all children from 1 · 6 to 2 · 5.) The number of repetitions and the number of "babbling series" were counted for each child. She studied also the frequency of the various parts of speech.

In analyzing the types of sentences Smith considered whether they were structurally complete, incomplete, or single-word; and whether they were simple, complex, or compound. Her classification for sentence analysis, adapted from Snyder, follows:

- Declarative
  - Variations of imperative
  - Declarative in function
    - Personal
    - Impersonal
- Imperative
- Interrogative
  - Variations of imperative
  - Request for permission
  - Request for approbation of corroboration
  - Questions of fact
    - Half question, half exclamation
    - Interrogative words
- Exclamatory

Although negative sentences were given special study, none were reported upon.

In 1935 Dr. Smith published A Study of some Factors Influencing the Development of the Sentence in Preschool Children, in which she analyzed three hundred and five records for two hundred and twenty children ranging from 18 to 72 months in age. (In this study some of her tables show age-groupings by half-years.) (28)

For the purpose of extending and developing her former study, and in order to make use of leads suggested by more recent work, chiefly that of McCarthy and Piaget, Smith covers the following in this investigation:

1. Sentence length.
2. Effect on the sentence of the differences in observational situations between her study and McCarthy's.
3. Sex differences.
4. Constructional analysis of the sentences.
5. Functional analysis of the sentences.
6. Parts of speech.
7. Types of errors (for which an error index is figured).
8. Effect on language development of mental age.

9. Of social class.
10. Of order of birth.
11. Relation between sentence length and size of vocabulary (for which her vocabulary test is used).

For all of the subjects on whom mental ratings could be obtained the average IQ's for each age-group were as follows Two years, 113; three years, 106; four years, 112; five years, 111.

Piaget's stimulating work has been discussed somewhat already (24). At first, it was hoped that Piaget's methods could be followed so that his data on seeing children might be used for comparison with ours on blind and low-visioned children. His functional interpretation of language had considerable appeal, and there was additional weight in the fact that his subjects were of about the same age as the two children with whom we began our work. However, when we analyzed responses made by our children, according to his method, we found ourselves in frequent quandaries regarding their proper classification. When a study of his sample conversations left us wondering about some of his own decisions, it was decided that there were too many opportunities for subjective errors on the part of the recorder. McCarthy and Day have been able to follow his procedures of analysis with some success, although they obtained a very different picture regarding egocentrism.

## DISCUSSION

These four authors have used the observational method. Fisher, Smith, and Piaget have recorded all spontaneous speech for specified lengths of time, in free-play situations. McCarthy obtained fifty responses, regardless of time, in established adult-child situations where the speech was initiated by materials chosen by the observer. All four authors have recorded verbatim responses. All but Piaget worked with a large enough group of children so that averages have some meaning statistically. Fisher and Piaget recorded the situations of which the child's conversation was a part. Apparently McCarthy recorded only the remarks made by the observer in order to stimulate speech in the child. Judging by the samples given in Smith's first study, she recorded only the responses of the child being observed. However, since the 124 records in this first study were included in the 259 of the second, which she analyzed according to McCarthy's classification, she must have had more situational information than her samples indicate.

There has been little or no consistency in the length of observational language records. Some have been all-day records made by

parents on their own children, others have been for fifteen minutes, an hour, three hours, and so forth. In some, the experimenter has done his own recording, in others trained stenographers have been employed, and in a few cases the observer has dictated to a stenographer in the presence of the child. This last procedure would be impracticable for any study of blind or low-visioned children because of their responsiveness to the sound of voices. Neither would all-day or other observations be practicable because of the difficulty of recording during the times when the children were bathing or washing, after the light was out at night, during rhythms, or at other times when two or three children were talking at once within a limited amount of space.

Because of the fact that it is hard to take down every word a young child says some observers have used the short-sample method which does not put too heavy a strain on the observer's attention, or have resorted to a device in which only certain chosen characteristics are checked.

There is diversity, likewise, in the treatment of the data. Although a number of writers make their notes in the interest of vocabulary counts, or of sentence development, or of parts of speech, there is much variation in deciding what is a word and what is not, whether repetitions, rhymes, and songs should be included in word counts or in analysis of sentence structure, and whether consideration should be given to all words used, to the different words only, or to both total number of words and different words.

### BIBLIOGRAPHICAL SOURCES

In the Bibliography references are given which deal with the different procedures in the study of language development in preschool children. Excellent discussions of techniques are to be found in the *Twenty-Eighth Yearbook* of the Society for the Study of Education, in Goodenough's *Measuring Behavior Traits by Means of Repeated Short Samples,* in Stoddard and Wellman's *Child Psychology,* and in Bott's *Method in Social Studies of Young Children.* What little material is available on the visually-handicapped preschool child may be obtained from the library of the American Foundation for the Blind, in New York City.

Interesting reviews of investigations on the language of the preschool child are to be found in the *Twenty-Eighth Yearbook* (1929), McCarthy's *Language Development of the Preschool Child* (1930), and McCarthy's *Language Development,* Chapter 9, *Handbook of Child Psychology* (1931).

## IV. COLLECTION AND TREATMENT OF THE DATA

### COLLECTION OF DATA

Stoddard and Wellman summarize the limitations of observational methods by saying that:

1. They are not economical of time.
2. Certain kinds of observational studies are very difficult to treat in statistical fashion, although this can be overcome partly by checking and other devices.
3. It is difficult to evaluate the influence of external factors on the child's behavior, although this is supposed to be ruled out by the short-sample method.
4. Verification of results is difficult, although this is simpler under the verbatim-record method than with checking.

The advantages of the observational methods are given by them as follows:

1. Often no change of apparatus or conditions is necessary.
2. There is no need for the direct cooperation of the child.
3. They are particularly useful for determining the amount of behavior under customary conditions.
4. They are useful where interaction of the group is concerned.

For the purposes of this study the advantages of the verbatim-record form of the observational method outweigh its disadvantages. Furthermore, they outweigh the advantages of any other method for use with this particular group of children. Test procedures or stimulative materials introduce extraneous factors calling for considerable experimentation in themselves. The materials used with seeing children almost always make their first appeal through vision. By the time substitutions are made which appeal to the other senses of blind children, an imponderable source of error has been introduced.

In this investigation verbatim reports have been made of the children's spontaneous language during their free play. Six of the records were obtained at the Arthur Sunshine Home and Nursery School for the Blind and two at the Boston Nursery for Blind Babies. As soon as possible, the observations were transferred from the shorthand or abbreviated longhand notes to typewritten record-sheets. (See Appendix Two.) The sheet has columns for *Time, Place, Stimuli,* and *Child's Language.* Note is made of the times at

which the record starts and ends. On some the time has been recorded at 5-minute intervals. Under *Place* each change in general location is reported. For instance, on the sample sheet, note is made when Simon goes to the pavilion because of the fact that the pavilion, where the carpenters' benches are located, is at least 200 feet from the driveway by the barn where the record began. The heading *Stimuli* covers everything noted in the situation except the language of the observed child. When his speech is related to that of another person, what the second person says is reported under *Stimuli* in sufficiently complete form so that the connection will be clear. When the stimulating child's speech cannot be caught, note is made of the fact that he spoke. The focus of the observer's attention, however, is upon the language of the observed child, which is recorded as completely as possible. Although by no means all idiosyncrasies of pronunciation can be expressed, an effort has been made to record some of those which seem to be especially characteristic of the child, as for instance, a West Virginia child's *hit* for *it*.

So far as can be discovered no extensive investigation has been made regarding the best length of time for verbatim-report records on language. Each author has chosen what has seemed best to him. For the first two of our subjects at the Arthur Sunshine Home we followed Fisher in recording three full mornings within one week. Before the second record was completed whooping cough had broken into the school regime so completely that it became necessary not only to abbreviate the third day's report of the second record but to postpone all of the others indefinitely. Experience had taught us, however, that with our particular group three hours is too long an observational period. It seems unnecessary for the collection of the information we want and it exhausts the observer. The fact that it takes more than nine hours to transfer the original notes is a factor which must be considered. Even when sufficient clerical assistance is available it is the observer who must dictate from her original notes.

The observational times as we finally used them for the children in this study were an hour in length for all but one whose record was 50 minutes. Some of these hour records are composed of the two half-hour reports taken on different days. Probably such a lack of uniformity in time procedure would not be defensible in a long-term investigation, but in this demonstrational study it seems permissible since each child's total time is an hour or nearly an

hour. In future studies probably three half-hour records for each child will be made on three different days during one week. However, as data accumulate, these half-hour records will be analyzed into shorter periods and combined to represent longer ones, so that we shall be able to obtain statistical evidence regarding the best length of time. For instance, if the percentages of egocentricity obtained in a 20-minute period differed little from those obtained in a 40-minute period, there would be justification for the shorter times. If the $D/\sigma$ diff. were low for the results obtained on different days there would be reason for cutting the number of days of observation for each child.

### OBSERVERS

The observers must have not only formal training in taking verbatim reports, and a system of shorthand or abbreviations which will make it possible to keep pace with the more rapid speakers, but they must have a high degree of self-criticism to guard them against imagining that they hear what it seems to them they should hear. Also, they must possess good hearing for words since many blind children do not hold their heads erect when they speak, with the result that their words are muffled.

Four people have taken the records in this study, all of them with psychological training. No observer recorded alone until she had had practice with another observer against whose reports hers were checked carefully. There are good reasons why it is better to have one observer, at the risk of sacrificing a little in accuracy, than to have two. It is not at all easy for two observers to keep out of the way of blind children without making their presence audible in some manner. Also, because of the tendency of children without sight to talk with their heads down, it is often necessary to stand quite near them in order to catch what is said. This means that one of the two observers has to step out of hearing frequently if the child is not to be disturbed.

### SUBJECTS

The eight children who have been used as subjects are all totally blind, or at best possessed of mere light perception. None of them is feebleminded. Otherwise, they vary in many ways which might have some effect on the nature of their language, as for instance the length of time they have been blind. (See Appendix One.) The children have been divided into two age-groups, the first averaging

40 months and the second 68 months. Since there are so few subjects the name and age of each is repeated in all of the tables given in the pages to come. This makes it possible to compare individual scores with those to be found in authors using different age-groupings.

### TREATMENT OF THE DATA

In the following sections the data obtained from these eight subjects are studied under the four groups of questions given in Section II. (In Appendix Two will be found samples of the record and analysis sheets, together with a detailed explanation of the symbols used. There is included also an individual record for Simon.) A critical attitude has been assumed toward each of the questions so as to make sure that only the promising ones are retained for future studies.

Statistical treatment is limited to the arithmetic involved in averages and percentages. The reliabilities of most of the procedures have been studied already by Fisher, McCarthy, and Smith on much larger groups of children than ours. Direct inspection of the figures given in the tables would seem to be the most accurate method for discovering trends which are sufficiently definite to warrant further study. Not only do we have too few subjects to give truly reliable statistical results, but in future studies the additional records will be upon children who vary widely in ways which will directly affect their language production. Only after enough records have been accumulated, and only after repeated observations are available on different types of children, will statistical treatment have meaning. Two or three years from now, therefore, a statistical investigation of the available data would seem to be essential in order that the characteristics of language development in blind and low-visioned preschool children may be brought into relief. Then, such an investigation will have much to offer in giving clearer insight into the causes and cures of many of the developmental anomalies to be found in this small but important class of children.

## V. FUNCTIONAL ANALYSIS

Whenever the conduct of an investigation will require the services of more than one experimenter, objectivity in the treatment of data becomes not only desirable but necessary. In the search for objectivity, however, the focus of one's thought should not be centered upon the technique but rather upon the problem. This intellectual error Dr. Fisher seems to have avoided. She has kept in mind the fact that she is testing the value of techniques for the solution of certain problems, rather than finding a problem to which cherished techniques may be applied. (12)

In her Functional Analysis Fisher has sought procedures which would be more objective than Piaget's, yet which would distinguish plainly the individual differences between children within, as well as between, age-groupings. Fisher's method does not entirely eliminate the need for subjective decisions on the part of the scorer, but it does reduce materially the occasions when such decisions are necessary. The value of using the subject of the sentence as the criterion for the functional analysis seems to have been made clear by Fisher's own study. If, through the use of her methods, this study brings out individual differences among its eight blind subjects, and if at the same time differences are indicated between these blind children and seeing children, the use of her methods would seem to be justified for other cross-sectional studies or for a longitudinal study.

*Categories I., II., and III., and the Coefficient of Egocentricity.*

1. What percentage of the child's remarks is about himself?
2. What percentage is about other persons?
3. What percentage is about things?
4. What is the child's interest in himself as compared with his interest in other persons and objects—his degree of egocentricity?

Answers to these four questions are sought through the analysis of the children's running conversation in terms of Fisher's three functional categories and her coefficient of egocentricity: Category I. (Self as subject of sentence), Category II. (Other person or persons as subject), Category III. (Thing as subject), Coefficient of Egocentricity— $\frac{\text{Category I.}}{\text{Cat. II.} + \text{Cat. III.}}$

In Category I. functionally complete but structurally incomplete sentences are included, provided that the subject of the sen-

tence clearly relates to the self. The same policy is followed in Category II. regarding other persons. In Category III. are to be found not only structurally incomplete remarks the subjects of which are clear, but incomplete remarks the subjects of which do not place them obviously in Categories I. or II. Non-verbal remarks are excluded for purposes of the functional analysis.

For the sake of clarity, the details regarding the scoring of the children's sentences have been relegated to Appendix Two. Since the Analysis Sheet has been arranged so that the responses could be classified at once for the Functional Analysis and the Social Indices, it will be necessary to refer for interpretation to the explanatory pages following the Analysis Sheet. Here, it is sufficient to say that the Roman numerals refer to the three Categories under Functional Analysis, and that they are to be found under both Complete and Incomplete Sentences. The Coefficient of Egocentricity is found by dividing the egocentric remarks in Category I. by the sum of the socialized remarks in Categories II. and III.

This Coefficient of Egocentricity, like Fisher's, must not be identified with Piaget's Measure of Egocentrism. Piaget endeavored to classify the child's remarks under the two main heads of Egocentric and Socialized, the latter head covering those remarks which were definitely addressed to another person so as to convey information, commands, derision, etc., while the former included remarks which were essentially monologue. Such a remark as "I am stronger than you" would be classed by Piaget as socialized, by us as egocentric; while a statement like this, "Now the blocks have all fallen down," addressed to no one in particular, would be classed by Piaget as egocentric, by us as non-egocentric. We are seeking a measure of the child's concern with himself as compared with his interest in other people and in things; but it must be admitted that our measure, while objective, is not a complete measure of the variable we have in mind.

In her nursery school group of superior children Fisher found no correlation between the percentage of responses in Category I. and chronological age (Pearson *r* of .0045). With notable consistency, from the 24th to the 60th month, the children made themselves the subject of about a third of their remarks. Whether they referred to themselves in the first or the third person, this much of their language had to do with their expression of themselves. Her only group averaging less than 30% in egocentric speech is the youngest (18 to 23 months), and this is probably due to the incom-

pleteness of their speech rather than to any lack of egocentrism. Her second Category shows a positive correlation of $+.69 \pm .04$ with increase in age, whereas there is a negative correlation with chronological age of $-.67 \pm .04$ for Category III. In Category II. there is a definite rise for each age group through 42–47 months, after which there is a very slight drop—so slight that it would seem to indicate attained stability rather than regression. Since her records do not extend beyond 60 months, there is no way of knowing whether these percentages would remain stable during the sixth year.

In Category III. following an initial big drop in the 24–29 months age-group resulting from the increasing completeness of speech forms, there is a drop each half year in the percentage of

TABLE I

PER CENT OF TOTAL REMARKS IN THE VARIOUS CATEGORIES AND THE COEFFICIENT OF EGOCENTRICITY

| *Subject* | *Age* | *Total No. of Responses* | *Per Cent of Responses in* | | | *Coefficient of Egocentricity* |
|---|---|---|---|---|---|---|
| | | | *Cat. I* | *Cat. II* | *Cat. III* | |
| Carolina | 38 mo. | 75 | 33.3 | 8.0 | 58.7 | 50.0 |
| Varney | 40 mo. | 114 | 43.8 | 39.5 | 16.7 | 78.1 |
| Kim* | 42 mo. | 177 | 32.1 | 39.3 | 28.6 | 47.4 |
| Average | 40 mo. | 122 | 36.4 | 28.9 | 34.7 | 58.5 |
| Barnard | 62 mo. | 96 | 33.3 | 20.8 | 45.9 | 50.0 |
| Frank | 65 mo. | 194 | 27.3 | 30.4 | 42.3 | 37.6 |
| June | 69 mo. | 213 | 23.0 | 27.7 | 49.3 | 29.9 |
| Simon | 71 mo. | 279 | 24.0 | 29.1 | 46.9 | 31.6 |
| Conley | 73 mo. | 175 | 26.3 | 30.8 | 42.9 | 35.7 |
| Average | 68 mo. | 191.4 | 26.7 | 27.8 | 45.5 | 37.0 |
| *Author* | | *Subjects* | | | | |
| Fisher** | 36–41 mo. | Boys & Girls | 35.0 | 38.8 | 25.8 | 55.6 |
| Fisher | 42–47 mo. | " " | 31.0 | 45.4 | 23.6 | 45.7 |
| Fisher | 54–60 mo. | " " | 36.0 | 41.2 | 23.0 | 57.8 |
| Piaget*** | 3 yrs. | | | | | 56.0 |
| Piaget | 5 yrs. | | | | | 46.0 |
| Piaget | 6 yrs. | | | | | 45.0 |
| Smith**** | 30–41 mo. | | | | | 33.0 |
| Smith | 42–53 mo. | | | | | 26.0 |
| Smith | 54–65 mo. | | | | | 26.0 |
| Smith | 66–72 mo. | | | | | ..... |

* Nineteen responses of singing and repeating rhymes were included for this subject to make the data comparable with those of Fisher.

** See Fisher—Table VI (12).

*** See Piaget—Appendix (23).

**** See Smith—Table VI (28).

remarks having the thing as subject of the sentence, until the 54–60 months' age-group in which there is a very slight rise. In the absence of percentages beyond 60 months, it may be assumed that this category had reached functional stability during the period between 47 and 60 months.

Among the eight blind children in our group there are some interesting variations from these figures for seeing children. In Table I will be found the percentages of each child's responses under each of the three categories, as well as the average percentages for the two age-groups into which the children fall. The last column gives the coefficients of egocentricity. At the bottom are to be found more or less comparable figures from other authors.

If our older children could have been observed when they were enough younger so that their figures would have compared more directly with those of Fisher's oldest group, discussion of the results would have been easier. However, blind and low-visioned children must be studied when they are available rather than when they will fit most conveniently into age-groupings.

Under Category I. the average for the first three children, or the individual figures for the first, third, and fourth children, might tempt one to assume that blind children differ not at all from those with sight in their proportion of egocentric language. However, when one sees that 43.8% of the second child's speech concerns himself, one becomes cautious about drawing conclusions.

The percentages for the older group of children also incline one to caution. On the basis of Fisher's figures it might have been assumed that five-year-olds continue to devote a third of their language to themselves, and that six-year-olds might be expected to deviate but slightly. However, only the youngest child in our older group exceeds 30%. The average for the older group (62 to 73 months) is only 26.7%, whereas Fisher's oldest group (54 to 60 months) has an average in Category I. of 36%.

Do these lower percentages among the blind children indicate what might be expected of seeing five- and six-year-old subjects? Are they typical of blind and low-visioned children? Or, are they representative of our few subjects only? To none of these questions do we have answers. Only longitudinal studies of as many visually handicapped children as possible will supply information on the last two questions, and before we can know the answer to the first, a cross-sectional study must be made on seeing five- and six-year-old children in order to make a comparison possible.

Judging by 40-month-old Varney's high percentage of egocentric remarks, as well as by the low percentages of the older group, this technique sets forth individual differences satisfactorily. A glance at the figures under Categories II. and III. will bear out this impression. Table I shows a reversal of Fisher's results in the relationship between advance in physical age and interest in things and people.

The variability in percentages on Categories II. and III., for our three youngest subjects, obscures any trend which might appear if we had more children in this age-group, although the averages do show a tendency contrary to that indicated by Fisher's averages for the age-groups 36–41 and 42–47 months.

Where the older group is concerned, however, there is a distinct trend. Since these children are older than Fisher's oldest group, and since her percentages in Categories II. and III. had become fairly well stabilized by the fourth year, it would be reasonable to expect scores of 40% or more for our group in Category II. and of 23% or less in Category III. Instead, all five children in the older group have scores in Category II. ranging from 33% *down* to 23% and in Category III., from 42% *up* to 49%.

There is a possibility that such a reversal might have been found among seeing children if Fisher had continued her study on older subjects, although this does not seem probable. It is likely that this concern of our older children with things, as represented by their high percentages in Category III., may be a distinguishing characteristic of blind children at this age level. The fact that two of the three in the younger group have higher percentages under Category III. than would be expected lends further strength to this possibility.

The tendency of these blind children, who vary widely in personality make-up and in previous visual experience, to make objects the subject of the sentence in such a large percentage of cases is of particular interest. It may be due to the ever-present necessity of constantly hunting for things which a seeing child would locate visually. It may be that once the blind child's interest is aroused in the external world, he uses language as one effective substitute for vision in making contact with that world. That is, he may keep his spatial orientation and his sense of personal security through constant conversation with people around him, and through frequent questionings. A seeing child would accomplish the same results by a casual glance. He would know whether his teacher

was around, he could see for himself where his hammer lay, and where the playyard gate was located. Consequently, he would not need frequent verbal assurances from his teachers and playmates.

In the residential nursery of the Arthur Home, where children are admitted whose training has been neglected until they are more than a year old, the constant effort is to find some way of interesting the babies in their environment. Despite their lack of development, the very methods to which these babies resort in their resistance against efforts to draw them out from their entirely satisfactory, self-limited, world gives the definite impression that they are well above the level of feeblemindedness. Is it possible that when these children do break through their shells of egocentrism they will become as attentive to objects and things as are the children in this study? As they grow older will their concern be with things predominantly, or will they more nearly approach the percentages for seeing children in their interest in other people and in themselves?

The coefficients of egocentricity vary from child to child yet they do indicate a general downward trend with increase in age. In the younger group one of the children, Carolina, is about 6 points lower than the average for Fisher's 36–41 month age-group, whereas Varney has a very high coefficient. Kim's coefficient is close to that which Fisher obtained for the 42–47 months group, but this particular coefficient of Fisher's is not consistent with those for the age-groups preceding and following it. The coefficients for our older group are notably lower than are those found by Fisher.

Piaget's and Fisher's coefficients of egocentricity approximate each other at the different age levels in spite of the different procedures used in figuring them. In the Appendix of his *Judgment and Reasoning in the Child,* Piaget gives a table of eight coefficients of egocentricity, showing a decreasing ratio with increase in physical age from three to seven years. (23) Fisher, on the basis of correlations obtained on her larger number of children, found no such relationship between chronological age and the coefficient of egocentricity (Pearson *r* of .0045).

In her study on the development of the sentence Smith found a decrease in this coefficient with advance in age from 40 at age two to 26 at ages four and five. (28) (Smith followed McCarthy's modification of Piaget's procedure in the classification for her Functional Analysis, but her data were obtained through the use of verbatim reports of children's language rather than by McCarthy's

technique of recording 50 remarks in a set child-adult situation.) McCarthy herself obtained very small percentages of egocentric responses. None of her figures for boys and girls combined is over 5%. (McCarthy, Table XIV.) Her highest percentage of egocentric responses is for boys at 42 months of age, and it reaches only 7.2%. Obviously, McCarthy's coefficients of egocentricity would have been very low indeed if she had figured them. (20)

Day's study of language development in twins followed McCarthy's procedure on both the collection and treatment of data,

TABLE II

PER CENT OF COMPLETE QUESTIONS, COMMANDS AND STATEMENTS IN TOTAL RESPONSES*

| *Subject* | *Age* | *Total No. of Responses* | *Questions* | *Commands* | *Statements* |
|---|---|---|---|---|---|
| Carolina | 38 mo. | 75 | 6.7 | 10.7 | 5.3 |
| Varney | 40 mo. | 114 | 20.2 | 16.7 | 43.9 |
| Kim** | 42 mo. | 177 | 11.3 | 21.5 | 29.4 |
| Average | 40 mo. | 122 | 12.7 | 16.3 | 26.2 |
| Barnard | 62 mo. | 96 | 34.4 | 8.3 | 35.4 |
| Frank | 65 mo. | 194 | 24.2 | 12.9 | 34.0 |
| June | 69 mo. | 213 | 41.8 | 9.4 | 20.2 |
| Simon | 71 mo. | 279 | 13.3 | 4.7 | 60.6 |
| Conley | 73 mo. | 175 | 30.3 | 4.6 | 33.7 |
| Average | 68 mo. | 191.4 | 28.8 | 8.0 | 36.8 |
| *Author* | | *Subjects* | | | |
| Fisher | 36–41 mo. | Boys & Girls | 15.0 | 15.0 | |
| Fisher | 42–47 mo. | " " | 11.7 | 17.3 | |
| Fisher | 54–60 mo. | " " | 11.6 | 14.0 | |
| McCarthy*** | 36 mo. | " " | 13.2 | 9.4 | |
| McCarthy | 42 mo. | " " | 9.7 | 9.4 | |
| McCarthy | 54 mo. | " " | 8.2 | 6.4 | |
| Smith | 30–41 mo. | " " | 9.0 | 18.0 | 67.0 |
| Smith | 42–53 mo. | " " | 14.0 | 18.0 | 63.0 |
| Smith | 54–65 mo. | " " | 18.0 | 15.0 | 63.0 |
| Smith | 66–72 mo. | " " | 9.0 | 14.0 | 75.0 |

* Only complete sentences were included in the count but the percentages were based on total number of responses. This was done to make the data comparable with those of Fisher.

** Nineteen responses of singing and repeating rhymes were included for this subject to make the data comparable with those of Fisher.

*** McCarthy's percentages given in this table are based on comprehensible responses only. She included all emotionally-toned remarks with commands.

See Fisher—Table VI, (12).
See McCarthy—Table XIV, (20).
See Smith—Table V, (28).

and even lower percentages of egocentric responses were obtained. (10) Mabie, using Piaget's method in a study of the conversations of first grade pupils during free play, found that about 25% of the children's responses were egocentric. (16)

Rugg and his associates made a study of the language of kindergarten children by quite different procedures, and came to the conclusion that about 41% of the conversation of these children showed a naive interest in themselves and their own affairs. (25) Apparently, he included more under his term *self-assertion* than did Piaget or Fisher under their term *egocentrism.*

In order to find whether the coefficients of egocentricity for our subjects were affected by an unduly large percentage of responses in which the reference was unknown, under Category III., the coefficients of egocentricity were re-figured with these responses left out. This did not change the picture materially.

The coefficient of egocentricity has value, but it is the categories themselves which promise most for a longitudinal study. The coefficient will be worth figuring, at least, and may prove helpful as an artificial point from which to check the deviations of individual children.

### Questions, Commands, Statements

1. What percentage of the child's language is composed of questions?
2. How much does he indulge in commands, whether to himself, to other persons, or to things?
3. How much of his language consists of statements?

TABLE III

Per Cent of Questions, Commands, Statements and Undetermined Responses

| *Subject* | *Age* | *Total No. Responses* | *Questions* | *Commands* | *Statements* | *Undetermined* |
|---|---|---|---|---|---|---|
| Carolina | 38 mo. | 75 | 12.0 | 12.0 | 62.7 | 13.3 |
| Varney | 40 mo. | 114 | 29.8 | 16.7 | 53.5 | 0.0 |
| Kim | 42 mo. | 177 | 14.7 | 22.0 | 37.9 | 25.4 |
| Average | 40 mo. | 122 | 18.8 | 16.9 | 51.4 | 12.9 |
| Bernard | 62 mo. | 96 | 34.4 | 8.3 | 53.1 | 4.2 |
| Frank | 65 mo. | 194 | 34.0 | 12.9 | 47.9 | 5.2 |
| June | 69 mo. | 213 | 48.4 | 9.4 | 34.3 | 7.9 |
| Simon | 71 mo. | 279 | 18.3 | 4.7 | 72.7 | 4.3 |
| Conley | 73 mo. | 175 | 42.3 | 5.7 | 45.1 | 6.9 |
| Average | 68 mo. | 191.4 | 35.5 | 8.2 | 50.6 | 5.7 |

In considering *Questions* and *Commands* we have followed Fisher. The heading *Statements* covers simple answers to questions and other mere statements of fact, and can therefore be compared with Smith's *Declarative Sentences.* Probably the percentage of simple statements which a child makes is not functionally important, yet it is interesting to see, in Table II that only one of the children even approaches the high percentage of declarative statements found by Smith. If those responses are removed from Category III. in which the reference is undetermined, the percentages of statements for the blind children are raised many points. Only two, however, approach those for Smith's seeing children. Possibly the blind children are too busy asking questions to have time for statements.

The *Questions* column in Table II is interesting. Taken as a group, the eight blind subjects ask many more questions than do Fisher's seeing children. Two of the three younger children ask fewer than would be expected and one asks more. In the older group one child had a score which was almost as low as those obtained by Fisher for her three oldest groups (42–47 months, 11.7%; 48–53 months, 11.3%; 54–60 months, 11.6%). In Table II only complete sentences were counted, although the percentages were based on the total number of responses. This was done to make the data comparable with those of Fisher. In Table III incomplete as well as complete responses have been included. On this basis the percentages of questions rise markedly. This large number of questions may explain at least partially the low percentages obtained by this group of children for egocentric remarks and the high percentages under Category III. The children may have been too busy being interrogative to have time for egocentric expression, and many of their questions may have been concerned with the whereabouts of things, which would place such questions in the third category.

Fisher obtained a slight decrease in the number of questions with increase in physical age (12).

Smith in her first study (27) reports an increase in the number of questions with increase of age. In another study (26) she reports that the percentage and the total number of questions in the total number of sentences increased with each half-year up to four. Forty-nine per cent of the children asked questions at the two-year level and this increased each year up to five, when 95% of the children asked questions. A later study (28) reveals the same trend up to the 66th month, when there is a definite decrease in the number of questions asked.

Piaget found that 17% of Lev's language and 13% of Pie's consisted of responses which were interrogative in character (24).

McCarthy found that when she figured the percentage of questions on the basis of the total number of responses there was an increase with chronological age which was most rapid in the younger age levels (20). When only comprehensible responses were considered, questions maintained a relatively important position throughout the age-groups. Rugg reports that in the group of kindergarten children which he studied only a tenth of the responses consisted of questions (25).

In an interesting study made by Boyd on his daughter, during which he recorded 1250 of her responses each year within a few weeks of her birthday, he found a regular decrease in the percentage of questions from the third birthday through the sixth, after which there was a slight increase (6).

This subject of questions asked by preschool children seems to lead to such rich territory in the study of language and personality of the preschool blind child as to warrant an independent investigation. Piaget (24), Smith (26) (27) (28), Nice (21) (22), Davis (9), and others have made stimulating contributions which can serve as guides.

In *Commands* the youngest subjects differ little from those in Fisher's study. However, our older group seem able to manage with very few commands. This was surprising to the adults who knew them, because they are far from being meekly compliant youngsters. Close observations of their daily behavior, however, confirmed the percentages given in Table II. The two children with the lowest percentages had learned more productive ways of expressing their imperative wishes. Probably this is true of a third, also. June suffered greatly with her eyes and was inclined to stay apart from the other children, although she talked freely and imaginatively to adults. Frank, whose score is the highest for the older group, was the one who would be the least suspected of imperiousness. When he came to the Arthur Home he had many fears. He had not entirely overcome his "softness" at the time of the observational record. Yet observation of him under different circumstances gave evidence that he would often risk another child's displeasure by commanding him rather than wait on himself.

Fisher finds as many commands in the language of her subjects as she does questions (12). There is a slight increase in the number of commands up to 42 months after which there is a slight decrease.

She obtained a Pearson $r$ of $+.32 \pm .07$ with chronological age, but none with IQ.

For our children there are as many commands among the three youngest as there are questions. Of the older children, however, Frank alone gives many commands and he is as imperious as are Fisher's four-and-a-half-year-old subjects. Because of the fact that Fisher's oldest group gave fewer commands than did the preceding one it may be that her six-year-old group, if she had had one, would make no more commands than did Frank.

Boyd's daughter gave the largest number of commands at the ages of two (17.1%) and six (10.2%) (6). For the years in between the per cents were 8.6, 9.0, 8.9. At seven years she gave only 5.7% of commands.

When enough data could be collected, through a longitudinal study, it would be interesting to investigate the methods by which visually-handicapped children obtain what they want. In other words, do they learn quickly that guile is more effective than command, or are they simply so uninterested in the world about them that they do not feel the need for imperative forms of speech? The latter does not seem at all probable, judging by the great number of questions they ask.

### DRAMATIC IMITATION, WORD PLAY, EXACT REPETITION

1. How much interest does the child show in dramatic imitation?
2. How much word play does he indulge in?
3. How much exact repetition does he use of what he himself says?

Any observer of children from four to six years of age cannot but be impressed by the amount of imitative play in which they indulge. Observation of blind children of this age makes one feel that there is much less of this type of play among them than there should be. It was hoped that a valuable criterion of such activities might be obtained through a study of the spontaneous language of blind and low-visioned children.

For this reason McCarthy's method of indicating dramatic imitation in language has been incorporated in this study, despite the low scores she found (20). Day, following McCarthy, found equally small percentages in her study of twins (10).

McCarthy defines dramatic imitation for her purpose as consisting of "all talk in imitation of the conversation of adults, like imaginary imitative telephone conversation. It includes also imitation

of sounds made by animals, like 'bow-wow-wow,' 'meow,' 'moo moo,' and the imitation of the sounds of automobile horns, etc.'' She continues, ''Piaget probably would put such remarks in one of the categories of egocentric speech, but while many such remarks might be placed there, some of them are used in decidedly social situations and in social contexts, and hence this classification has been provided for them in this study.''

Woodworth looks upon imitative play as an aid to self-assertion through the satisfaction it gives to the mastery impulse (31). Any method would be welcome which could stimulate constructive self-assertion in preschool visually-handicapped children, through the use of dramatic imitation.

However, if we were to judge from the scores made in this study, most of the children have no tendency toward dramatic imitation (Table IV). It seems probable that this particular technique for checking dramatic imitation is not adequate. It indicates so little that there seems to be no object in considering its usefulness in further studies.

TABLE IV

FREQUENCY OF REPETITION, DRAMATIC IMITATION AND WORD PLAY IN TOTAL NUMBER OF RESPONSES

| *Subject* | *Age* | *Total Responses Number* | *Exact Repetition* | | *Dramatic Imitation* | | *Word Play* | |
|---|---|---|---|---|---|---|---|---|
| | | | *Number* | *Per cent* | *Number* | *Per cent* | *Number* | *Per cent* |
| Carolina | 38 mo. | 75 | 1 | 1.3 | 1 | 1.3 | 0 | 0.0 |
| Varney | 40 mo. | 114 | 26 | 22.8 | 0 | 0.0 | 0 | 0.0 |
| Kim | 42 mo. | 177 | 23 | 13.0 | 0 | 0.0 | 0 | 0.0 |
| Average | 40 mo. | 122 | 16.7 | 12.4 | 0.3 | 0.4 | 0 | 0.0 |
| Barnard | 62 mo. | 96 | 5 | 5.2 | 0 | 0.0 | 0 | 0.0 |
| Frank | 65 mo. | 194 | 13 | 6.7 | 2 | 1.0 | 14 | 7.2 |
| June | 69 mo. | 213 | 28 | 13.1 | 0 | 0.0 | 7 | 3.3 |
| Simon | 71 mo. | 279 | 8 | 2.9 | 6 | 2.2 | 6 | 2.2 |
| Conley | 73 mo. | 175 | 10 | 5.7 | 0 | 0.0 | 0 | 0.0 |
| Average | 68 mo. | 191.4 | 12.8 | 6.7 | 1.6 | 0.6 | 5.4 | 2.5 |

The term *word play* is used to cover the repetition of expressions, words, sentences, rhymes and songs, indulged in by the child apparently for his own amusement, yet not covered by any other heading. Probably Piaget would include word play under *echolalia,* of which he found 2% for Pie and 1% for Lev (24).

In his study of the spontaneous conversations of kindergarten children Rugg associates under *linguistic experimentation* a group of items which seem to compare more closely than that of any other study with what is included here under *word play* (25). Of the 3,125 responses which he studied, he found that 188, or 6%, came under this heading. These were divided as follows:

| | |
|---|---|
| Rhythmic grouping of sound | 1.10% |
| Play upon a word | 2.50% |
| Repetition of sounds heard | .15% |
| Repetition of words heard | .99% |
| Play with rhyme | .58% |
| Recognition of differences in pronunciation | .20% |
| Play upon an idea | .48% |

Table IV shows no word play for the younger children. It is interesting to note that for the three children using it the largest amount of word play occurs in the language of the child with the highest mental rating.

Since so few of the children make use of word play, as it is defined in this study, its usefulness for later studies would seem to be limited.

*Exact repetition* is discussed by Fisher under her Construction Analysis and will be considered in that section of this study also. However, it is placed here because it seems to be a response which is definitely functional in character in that it is vocalization for the satisfaction of the speaker, usually without regard to the presence of an audience. Every time that there has been a repetition of a whole remark note has been made of it. Repetition of parts of remarks have not been counted, although a study of such partial repetitions might be of interest from the point of view of corrective speech. Remarks have not been considered repeated if the second varies somewhat in verbal or grammatical structure from the first. For instance, "It's raining. It's raining today." The second remark would not be considered a repetition because of the fact that the word *today* had been added.

In this study, the classification of repetitions has been made on an entirely structural basis. Piaget, on the other hand, made his on a purely functional basis, considering the ideas which were being repeated rather than the actual terminology. For his two six-year-old subjects Piaget found only 2% and 1% respectively of repetition, or echolalia.

In spite of the limitations placed upon Fisher's classification she obtained higher percentages than this. Her results showed definite decrease in the use of exact repetition with increase of age. In general, the blind children in this study show the same trend. Four out of the five older ones had smaller percentages of exact repetition than did Fisher's in her 54–60 months group. The only child in the older group to use a great deal of exact repetition is June, who usually talks with her head down and who must frequently repeat sentences in order to have them understood. Carolina's limited use of exact repetition may be due partly to failure of the observer in recording every instance. Because of her southern pronunciation it was often difficult to tell what she was saying and it may be that the observer's attention was diverted from recording repetitions by the effort to catch meanings.

However, the definiteness with which the individual differences of Carolina and June are marked off indicates one service which this particular classification may perform. If further studies show that for most blind children, as for most of those who see, exact repetition decreases with advance in age, any marked variations from the general trend such as these might give insight into the problems of the deviates.

## SUMMARY

The majority of the questions and procedures used in this section have proved practicable for inclusion in further studies of the spontaneous conversation of visually-handicapped preschool children.

Adequate information regarding the subject matter of the child's talk can be obtained through the use of Fisher's three categories and her coefficient of egocentricity, (Category I., the Self as subject; Category II., Other Persons as subjects; Category III., Things as subjects; Coefficient of Egocentricity, Category I. divided by the sum of Categories II. and III.)

Although the coefficient of egocentricity does not offer as much as does the direct study of the three categories, it will be retained for the longitudinal study because of the ease with which it can be figured. Also, it may have diagnostic value in isolating the cases having unusually high or low coefficients.

The questions relating to percentages of *questions* and *commands* promise a better understanding of the special developmental problems of visually-handicapped preschool children. The question

about *statements* may not be continued for a longitudinal study since it appears to offer little for our purposes, compared with the six preceding questions.

With regard to the question on *dramatic imitation,* it seems clear that where blind children are concerned, at least, some better way of answering it can be found than through this particular technique. Another question to be dropped is that relating to *word play* since this classification also does not give sufficient returns for the time it requires to figure it.

The last question, that relating to *exact repetition,* promises to set off individual differences distinctly and will therefore be retained for future studies.

## VI. SOCIAL INDICES

1. How much of the child's speech consists of emotionally-toned responses?
2. What indication does his speech give regarding his negativism?
   a. Does his use of negative statements and *No* answer this question?
3. How much does he use the names of children and adults?
4. What tendency does he show toward sharing his experiences with others?
   a. Does his use of *we, us,* and *our* answer this question?

These four questions have been included because it was felt that if they pointed to definite trends, we might find ourselves on the trail of good diagnostic instruments for the study of personality development in the blind and low-visioned child. The term *Social Indices* has been borrowed from Dr. Fisher. The column in Table V headed *Emotionally-Toned Responses* has been taken from McCarthy. (20).

### Emotionally-Toned Responses

The frequency with which "nervousness" and tension are found among visually-handicapped children of whatever age presents a recognized problem to their educators. Thus far, there has been no extensive investigation of it, but McCarthy's conception of *emotionally-toned responses* seems to hold promise of at least a partial understanding of it. In classifying the responses of her subjects, McCarthy followed Piaget in looking at each sentence not for its structure but for what the child meant. It is clear that this particular classification (emotionally-toned responses) could hardly be treated in any other fashion.

Under this heading, McCarthy has extended Piaget's group of *commands, requests,* and *threats* to include all wish-words. Single-word sentences uttered with a decided emotional or commanding inflection are also included in this group. Our classification differs from McCarthy's only in that we have placed *criticisms* under this heading. Since she reports less than 1% of criticisms at each of the three age-levels quoted from her in Table V, their inclusion in her emotionally-toned classification would have had slight effect on the results. Neither could our inclusion of criticisms account for the much larger proportion of emotionally-toned responses among these subjects.

TABLE V
SOCIAL INDICES

| *Subject* | *Age* | *Negative Statements Per Hr.* | | *Emotionally Toned Responses Per Hr.* | | *Frequency of "Yes" Per Hr.* | | *Frequency of "No" Per Hr.* | | *Naming of Children Per Hr.* | *Naming of Adults Per Hr.* | *Frequency of We, Us, Our, Per Hr.* | *Total Responses Per Hr.* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | *Number* | *Per cent* | *Number* | *Per cent* | *Number* | *Per cent* | *Number* | *Per cent* | | | | |
| Carolina | 38 mo. | 0 | 0.0 | 15 | 20.0 | 6 | 8.0 | 1 | 1.3 | 0 | 0 | 1 | 75 |
| Varney ... | 40 mo. | 8 | 7.0 | 44 | 38.6 | 4 | 3.5 | 2 | 1.8 | 5 | 3 | 0 | 114 |
| Kim ..... | 42 mo. | 0 | 0.0 | 92.4 | 43.5 | 15.6 | 7.3 | 0 | 0.0 | 1.2 | 28.8 | 10.8 | 212.4 |
| Average... | 40 mo. | 2.7 | 2.3 | 50.5 | 34.0 | 8.9 | 6.3 | 1 | 1.0 | 2.1 | 10.6 | 3.9 | 133.8 |
| Barnard... | 62 mo. | 5 | 5.2 | 29 | 30.2 | 6 | 6.3 | 5 | 5.2 | 5 | 6 | 2 | 96 |
| Frank ..... | 65 mo. | 12 | 6.2 | 51 | 26.3 | 3 | 1.5 | 3 | 1.5 | 13 | 27 | 2 | 194 |
| June ..... | 69 mo. | 9 | 4.2 | 27 | 12.7 | 3 | 1.4 | 1 | .5 | 4 | 27 | 5 | 213 |
| Simon ..... | 71 mo. | 18 | 6.5 | 26 | 9.3 | 7 | 2.5 | 5 | 1.8 | 35 | 15 | 12 | 279 |
| Conley ... | 73 mo. | 16 | 9.1 | 25 | 14.3 | 6 | 3.4 | 12 | 6.9 | 12 | 28 | 7 | 175 |
| Average... | 68 mo. | 12 | 6.2 | 31.6 | 18.6 | 5 | 3.0 | 5.2 | 3.2 | 13.8 | 20.6 | 5.6 | 191.4 |
| *Author* | | | | | | | | | | | | | |
| Fisher ..... | 36–41 mo. | | 11.8 | | | | | 4.9 | | 6.4 | 3.5 | 3.3 | 83.8 |
| Fisher ..... | 42–47 mo. | | 14.1 | | | | | 7.2 | | 13.6 | 4.9 | 7.3 | 125.6 |
| Fisher ..... | 54–60 mo. | | 15.1 | | | | | 4.2 | | 21.7 | 3.9 | 8.4 | 120.0 |
| McCarthy | 36 mo. | | | | 8.9 | | | | | | | | |
| McCarthy | 42 mo. | | | | 9.2 | | | | | | | | |
| McCarthy | 54 mo. | | | | 6.4 | | | | | | | | |
| Smith ..... | 30–41 mo. | | 10.0 | | | | 2.4 | | 2.8 | | | | |
| Smith ..... | 42–53 mo. | | 13.0 | | | | 1.9 | | 1.8 | | | | |
| Smith ..... | 54–65 mo. | | 14.0 | | | | 1.1 | | .9 | | | | |
| Smith ..... | 66–72 mo. | | 11.0 | | | | .6 | | .8 | | | | |

See Fisher—Table XV, (12).
See McCarthy—Table XIV, (20).
See Smith—Table V, (28).

McCarthy found that emotionally-toned responses held a relatively less important position with advance in age. Whether this is true with her subjects because of the child-adult situation in which the older children would be exepected to respond with more social equanimity, or whether the picture would have been altered if she had obtained records for five- and six-year-olds, are matters of conjecture. The children in this study show also decreasing percentages of emotionally-toned responses, the downward trend beginning after Kim's score of 43.5% and continuing through Simon's. Conley, the oldest child, has a score of 14.3%. It will be noticed that the lowest for any of the blind children is that for 71-months old Simon whose 9.3% is just about equal to McCarthy's average for her 42-months-old group of 9.2%.

Table VI gives a further analysis of these responses. The terms *Optative* and *Hortatory* have been adapted from an uncompleted study made by Miss Elizabeth B. Farber while she was at the Bureau of Educational Experiments. The first is used to designate responses in which the child is definitely expressing a wish—"I want to go." The second indicates requests which are not imperative.—"You better pass the juice." This indirect expression of a wish is used frequently by Conley and Frank. Twenty-three per cent of Conley's emotionally-toned rseponses and 35% of Frank's are hortatory. On the other hand, only 2.5% of Frank's emotionally-toned responses are optative in nature. Even as young a child as Varney (40 months) seems to have learned the value of the hortatory approach for gaining one's ends.

The high percentages of optatives among the youngest children, and of imperatives for all eight are not surprising. What is unexpected, however, is the complete lack of threats, especially for Conley. General observation would lead one to say that Conley's usual method of threatening is indirect but effective—"Are you going to stop throwing things? Because I might have to take you by the neck."

Almost equally surprising is the tendency toward commendation. Only one child gave no approvals.

Obviously, emotionally-toned responses represent an outstanding characteristic of this particular group of blind preschool children. Since this result is in keeping with the general impression held by educators of the visually-handicapped, the question relating to emotionally-toned responses will be retained for a

TABLE VI

ANALYSIS OF EMOTIONALLY-TONED RESPONSES IN PER CENTS

| *Subject* | *Age* | *Total No. Emot. Toned Responses* | *Optative* | *Horta-tory* | *Impera-tive* | *Threats* | *Commen-dations* | *Criti-cisms* | *Exple-tives* | *Fears and Frustra-tions* |
|---|---|---|---|---|---|---|---|---|---|---|
| Carolina | 38 mo. | 15 | 40.0 | 0.0 | 53.3 | 0.0 | 6.7 | 0.0 | 0.0 | 0.0 |
| Varney | 40 mo. | 44 | 20.4 | 22.9 | 43.1 | 0.0 | 0.0 | 0.0 | 0.0 | 13.6 |
| Kim | 42 mo. | 77 | 46.7 | 10.4 | 39.0 | 0.0 | 2.6 | 0.0 | 1.3 | 0.0 |
| Average | 40 mo. | 45.3 | 35.7 | 11.1 | 45.1 | 0.0 | 3.1 | 0.0 | 0.4 | 4.5 |
| Barnard | 62 mo. | 29 | 27.6 | 20.7 | 20.7 | 0.0 | 6.9 | 10.3 | 13.8 | 0.0 |
| Frank | 65 mo. | 40 | 2.5 | 35.0 | 40.0 | 0.0 | 2.5 | 0.0 | 20.0 | 0.0 |
| June | 69 mo. | 27 | 3.7 | 11.1 | 55.6 | 0.0 | 7.4 | 14.8 | 7.4 | 0.0 |
| Simon | 71 mo. | 20 | 0.0 | 0.0 | 60.0 | 0.0 | 15.0 | 10.0 | 15.0 | 0.0 |
| Conley | 73 mo. | 26 | 11.5 | 23.1 | 42.3 | 0.0 | 23.1 | 0.0 | 0.0 | 0.0 |
| Average | 68 mo. | 28.4 | 9.1 | 18.0 | 43.7 | 0.0 | 11.0 | 7.0 | 11.2 | 0.0 |

longitudinal study. The analysis of these responses will be continued also, after the manner of the one given in Table VI.

### Negative Statements, No and Yes

Fisher was interested in the study of negative statements and the use of *no* as possible indicators of negativism or resistant behavior. If they should prove to be true indicators of such behavior, we should have not only a simple and objective technique for checking the degree of negativism in a particular child but also a method of recording the effect of training, improved health, and changed environment on the child's social adjustment.

In Fisher's group she found a Pearson $r$ of $.36 \pm .07$, between the use of *no* and chronological age, but an unreliably low correlation between the use of *no* and intelligence. She concludes that although its incidence is wide spread and frequent throughout the preschool years, it does not distinguish age or sex differences. She says that "excessive use or disuse at any age level would serve merely to indicate an unusually resistant or acquiescent child." (p. 71) In her study on the development of the sentence, Smith figured the percentage of imperative *no's* at each of her age-levels. The decrease which she found in the general use of *no* with advance in age was surpassed by the sharper decrease in the percentage of *no's* which were used imperatively.

According to Table V the use of *no* by the children in this study indicates a possible slight advance with age, such as Fisher obtained, although hardly one that could be called significant. Table VII shows, however, that when the use of the *no's* is checked against the situation which gave rise to them, they afforded no information whatsoever regarding degree of negativism. There were some negative responses which were not expressed as negative sentences and which did not involve a *no*. Furthermore, there were a number of reactions accompanying negative statements and *no's* which were definitely not negativistic, and other reactions about the negativism of which there could be some doubt.

Fisher did not record the *yes* responses in her study. They are included here in order to see what relationship might exist between them and the *no's*. Smith's *yes* responses are given in Table V. Compared with her percentages of *yes's* our children used this response freely, especially at the younger ages. There is a higher frequency of *yes's* at the lower age levels than at the higher and this is in keeping with the trend found by Smith.

TABLE VII

NEGATIVE STATEMENTS AND NO'S AS INDICATORS OF NEGATIVISM*

| Subject | Age | Negative Statements | | | | Use of "No" | | | | Other Neg. Responses | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Reactions | | | | Reactions | | | | |
| | | Total No. | Neg. | Not Neg. | Doubtful | Total No. | Neg. | Not Neg. | Doubtful | Total | Doubtful |
| Carolina | 38 mo. | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 1 | 0 |
| Varney | 40 mo. | 8 | 1 | 7 | 0 | 2 | 2 | 0 | 0 | 3 | 0 |
| Kim | 42 mo. | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 2 |
| Average | 40 mo. | 2.7 | 0.3 | 2.3 | 0 | 1 | 0.7 | 0.3 | 0 | 2.3 | 0.7 |
| Barnard | 62 mo. | 5 | 0 | 5 | 0 | 5 | 2 | 0 | 3 | 0 | 0 |
| Frank | 65 mo. | 12 | 0 | 9 | 3 | 3 | 0 | 3 | 0 | 1 | 0 |
| June | 69 mo. | 9 | 1 | 4 | 4 | 1 | 1 | 0 | 0 | 0 | 0 |
| Simon | 71 mo. | 18 | 3 | 13 | 2 | 5 | 0 | 4 | 1 | 2 | 2 |
| Conley | 73 mo. | 16 | 4 | 8 | 4 | 12 | 4 | 7 | 1 | 0 | 0 |
| Average | 68 mo. | 12 | 1.6 | 7.8 | 2.6 | 5.2 | 1.4 | 2.8 | 1 | 0.6 | 0.4 |

* When checked against their reactions at the time of speaking.

Where negative sentences are concerned, Fisher obtained a Pearson $r$ of $+.71 \pm .04$ between the use of negative sentences and chronological age. She looked upon this as an indication that the children tended to substitute verbal for physical resistance as their control over language increases. Since she could check her results against those on resistant behavior in preschool children found by Caille (7) for the same group of subjects, it may be true that increased use of negative sentences does indicate verbal resistance in children with sight. Whether it indicates a general increase in resistant behavior is not so clear, however.

Smith found a slight increase in the use of negative sentences with age up to 66 months, after which there there was a drop. Her percentages agree closely with those of Fisher, as will be seen in Table V.

According to the data in this study blind children make much less use of negatives than do those who see.

Kim, the most resistant child of the entire group, not only used no negative responses but he used not a single *no* during his observation period. Yet he was so negativistic that it was difficult for anyone to work with him. During the course of this record he frequently exhibited negativistic behavior. The fact that it did not manifest itself in *no's* or in negative responses may be the result of the teacher's careful handling of the situation.

In fact, the small percentages of negatives for all the children may be due at least in part to the technique of the nursery school teachers at the Boston Nursery and the Arthur Home.

For the purpose of finding out whether the negatives used by these children really stood for resistant behavior they were checked directly against the situation which called them forth. (Table VII) Of the negative responses, only a few definitely indicate negative behavior at any age; only the two oldest children can be said to have exhibited verbal negativism. There were 68 negative statements for the whole group, 46 of which were definitely *not* indicative of resistant behavior, and only 9 of which certainly showed verbal resistance. The picture for the *no's* is much the same.

That the use of negative statements and *no's* for the study of resistant behavior in preschool blind children would not be practicable seems to be fairly clear from our records. However, it does seem advisable to continue these items for the longitudinal

study tentatively, or until we find some clue to an explanation for the slight use made of negatives.

### Naming of Adults and Children

Fisher found nothing that was significant as a social index for her group of subjects in this naming of other children and of adults. Nevertheless, these frequencies were obtained here because of the general impression that blind children resort to naming of people much more than do children with sight. This has proved to be the case. (Table V) Fisher feels that the increase in naming of children which her figures show is more the result of individual differences than it is of actual age. In general, our group of children shows an increase with age. Individual differences are indicated by the fact that Simon names children 35 times during one hour, Frank and Conley 13 and 12 times, and Barnard and June 5 and 4 times. Some trend toward increase in naming with advance in chronological age is shown in the naming of adults, but it is the frequency with which adults at most ages are named that is striking. Only Simon names children more frequently than he does adults. If the two sets of frequencies for all the children are totaled, it will be found the number of times children are named is only 55.6% of the total namings of adults. Even Kim, who has no use for adults, nevertheless names them 28 times during an hour.

This high frequency of naming may indicate an excessive amount of attention-getting but there seem to be practical reasons for it from the point of view of children functioning without sight. The blind child makes use of naming, during his free-play time, first and foremost for the sake of spatial orientation and for a feeling of security in space. More than anything else, he feels the need of establishing spatial relationships with the nursery school teacher. Next, he wants to know which children are nearest him and what he can expect of them in the way of activity. If he cannot distinguish them and their location by any other sound, he makes it necessary for them to locate themselves by calling them by name.

### Amount of Speech

Closely connected with this, probably, is the large amount of language indulged in by the children, as indicated by the last column in Table V. Only two children can be said to have spoken

sparingly—Carolina, aged 38 months, and Barnard, aged 62 months. All of the others talked much. Conley was comparatively modest in number of responses only because his southern drawl made it impossible for him to squeeze more into an hour. He talked incessantly as he worked, whereas the other children "bunched" their speech.

This large amount of language seems to be due in part to the need for security. An adult or a child may be spoken to in order that he may be located, but the answer usually calls for further speech.

It would seem advisable to continue the items regarding naming of children and adults and to look more deeply into their implications from the point of view of personality development. Furthermore, it will be worth while to add to the original group of questions in this section another having to do with the total number of responses per hour, because of the tendency toward abundance of speech which this figure seems to indicate.

## We, Us, and Our

The last item has to do with the use of *we, us,* and *our.* Fisher found a Pearson *r* of .72 ± .04 between the use of the first personal plural and chronological age. (The correlation with IQ was +.18 ± .07) She comments on the fact that some children seem to remain impervious to the constant nursery school indoctrination of "We don't do that," or "We do it this way," whereas others adopt these forms early. In spite of the positive correlation between use of the plural form and chronological age, her conclusion is that "the present data can only apprise us of the facts that children (some of them almost in spite of themselves) use plural forms of the first personal pronoun more and more frequently as they grow older, and that girls tend to use such forms more than boys."

The records for our group of blind children indicate little if anything. It seems likely that a more effective index may be found by some other means which will show the extent to which the growing visually-handicapped child tends to include others in his activities, or to think of himself as a member of a group.

## Summary

Emotionally-charged language is a definite characteristic of these blind children, even though some decrease is observable with increase

in age. Analyzing the *emotionally-toned responses* in more detail sets forth trends which will be well worth further investigation.

It seems clear that negative sentences and the use of *no* indicate little of value regarding the resistant behavior of preschool blind children. Neither do our data give other adequate indices of negativism. However, because it seems desirable to locate, if we can, the reasons why blind children make less use of the negative form, *per se,* than do seeing children, the study of negative sentences and *no's* (also *yes's*) will be continued tentatively in a longitudinal study.

The naming of children and adults, which seems to have limited value as an indicator of social development for the seeing children in Fisher's study, nevertheless appears to have considerable social significance for the blind children in this group. It seems to indicate a need for verbal contact with others for the sake of increasing the feeling of security which seeing children obtain through constant visual verification.

The use of *we, us,* and *our* does not answer the question about the child's tendency toward sharing his experiences with others. It does not offer enough to justify the amount of work which its inclusion in a longitudinal study would entail. It seems likely that a more adequate answer would be obtained by a direct check of the child's activities than through a study of his language.

Judging by their average number of responses per hour, blind children talk a great deal more than did the seeing children in Fisher's group. It is probable that this quantity of speech indicates a need for security as does their extensive use of the naming of adults and children.

## VII. SENTENCE CONSTRUCTION

### QUESTIONS

1. What proportion of the child's remarks is complete, what incomplete, and what non-verbal?
2. In his incomplete sentences what are the omissions?
3. How much does he indulge in exact repetition of whole remarks?
4. What about the complexity of his sentence structure?
5. How do his responses compare in length with those of seeing children?
6. What is his range of vocabulary as compared with his general loquacity; that is, what is the ratio of the number of different words he uses to his total number of words?
7. What is the percentage of the different parts of speech in his total number of words and in his different words?

### COMPLETENESS OF RESPONSE

Smith analyzed her subjects' responses according to whether they were complete, incomplete, or just a single word. (27) She then obtained a ratio between the complete and incomplete sentences which showed a significant increase in the proportion of complete sentences at the ages of three and four, over the proportion used at two years, a possibly significant increase in complete sentences between the ages of three and four, but no significant increase between four and five.

McCarthy analyzed her subjects' sentences into complete and incomplete, but included under the complete sentences those which were functionally complete but structurally incomplete. (20) She found a decrease in the relative number of this type of structurally incomplete response with advance in age.

In Fisher's study complete remarks include only those which are "structurally complete sentences from a grammatical point of view, i.e., subject and finite verb stated." (12) The remaining responses are divided into incomplete and non-verbal.

For the non-verbal response Fisher obtained a Pearson $r$ of $-.42 \pm .07$ with chronological age. Up to the fourth year there was a rapid decrease in the amount of non-verbal speech and after that a slight increase. Although it could not be expressed statistically, Fisher discovered a change in the character of the non-verbal

speech between her younger and older age-groups. That of the younger children consisted largely of substitutes for speech forms they had not yet mastered, whereas that of the older children was composed largely of sounds, and train and boat noises.

McCarthy's incomprehensible responses correspond to Fisher's non-verbal. Speaking very generally, McCarthy's results are like those of Fisher in that incomprehensible responses decrease with age. However, McCarthy's younger children use many more such responses than do Fisher's, and her oldest children use practically none. Undoubtedly the absence of incomprehensible remarks in the older age-group is due to the child-adult situation which McCarthy used, and which would give little opportunity for the type of dramatic play responsible for most of the non-verbal remarks of Fisher's subjects.

For incomplete sentences Fisher obtained an $r$ with chronological age of $-.73 \pm .04$. The rapid drop in the use of incomplete sentences stops with the 36–41 months group. After that it continues more gradually through the 54–60 months group.

In spite of the differences in methods of collecting the data and in spite of the fact that she has placed all structurally incomplete but functionally complete responses under complete sentences, McCarthy reported the same general tendency toward a decreasing use of incomplete sentences with advance in age. Smith also found a decreasing use of incomplete sentences.

Fisher's study shows a definite increase in the use of complete sentences with advance in physical age (Pearson $r$ $+.73 \pm .04$). By the end of the fourth year her superior nursery school children were using a high proportion of complete sentences. In view of the obvious fact that much adult conversation consists of incomplete responses, these children would seem to have reached maturity in the proportional use of complete sentences, since their percentages lie between 80 and 90. That this is not due entirely to the high degree of selection in Fisher's group is shown from the fact that Smith, with her more nearly average group of subjects, finds proportions of complete sentences reaching 84% and 87% respectively for her four- and five-year-old groups. (27)

Fisher's method of analyzing completeness of sentence structure has been followed because it seemed to be the least subject to errors of judgement on the part of the analyzer. Table VIII gives the percentages of the various types of sentences and the total number

of responses for each of the eight children, as well as Fisher's results for the age-groups 36–41 months, 41–47 months, and 54–60 months.

The amount of non-verbal speech used by two of the three youngest subjects is quite comparable with that for Fisher's children of corresponding age, but the third child has used none. In the older group only one of the five indulges in non-verbal speech and he uses it sparingly.

All of the children, except Varney, use a larger proportion of incomplete and a smaller proportion of complete sentences than would be expected.

TABLE VIII

PERCENT OF COMPLETE SENTENCES, INCOMPLETE SENTENCES AND NON-VERBAL SPEECH IN TOTAL RESPONSES*

| *Subject* | *Age* | *Total No. Responses* | *Complete Sentences* | *Incomplete Sentences* | *Non-Verbal Speech* |
|---|---|---|---|---|---|
| Carolina | 38 mo. | 75 | 22.7 | 72.0 | 5.3 |
| Varney | 40 mo. | 114 | 89.5 | 10.5 | 0.0 |
| Kim | 42 mo. | 177 | 62.2 | 33.3 | 4.5 |
| Average | 40 mo. | 122 | 58.1 | 38.6 | 3.3 |
| Barnard | 62 mo. | 96 | 78.1 | 21.9 | 0.0 |
| Frank | 65 mo. | 194 | 71.1 | 28.9 | 0.0 |
| June | 69 mo. | 213 | 71.4 | 28.6 | 0.0 |
| Simon | 71 mo. | 279 | 78.5 | 20.4 | 1.1 |
| Conley | 73 mo. | 175 | 68.6 | 31.4 | 0.0 |
| Average | 68 mo. | 191.4 | 73.5 | 26.2 | 0.2 |
| *Author* | | *Subjects* | | | |
| Fisher | 36–41 mo. | Boys & Girls | 81.4 | 15.1 | 3.4 |
| Fisher | 42–47 mo. | " " | 83.4 | 11.9 | 5.3 |
| Fisher | 54–60 mo. | " " | 86.6 | 8.6 | 4.3 |

* Fisher—Table X, (12).

Through the frequency with which incomplete sentences are used by the children in trying to locate their playmates and teachers, the proportionately larger usage of incomplete sentences may stand for inadequate mastery over sentence form and consequent immaturity in language development. Yet it may stand for superior mastery of sentence form and greater maturity in language development. Also, it may relate directly to the institutional situation in which these particular children live.

Whatever the explanation, this analysis of the completeness of sentence form reveals a sufficiently striking difference between the

seeing children in other studies and these blind children to warrant its incorporation in a longitudinal study.

### OMISSIONS

The results with regard to omissions in sentences give cause for further inquiry concerning the high percentage of incomplete responses. McCarthy analyzed those of her subjects on the basis of the parts of speech omitted. (20) She gives figures for omissions of verbs, subjects, and miscellaneous parts of speech and in addition she gives bar diagrams for omission of both verb and subject and for omission of a preposition. (McCarthy, Tables XIX and XX, Fig. 12 and 13) In the present study, omissions were counted for verb, subject, verb and subject, object, preposition, and miscellaneous parts of speech.

In Table IX the per cents are figured on the basis of the total number of responses rather than on the number of incomplete ones. This is done to make the results comparable with those obtained by McCarthy. (20) So far as the omission of the verb or the subject is concerned, the blind children in this study do not differ materially from the seeing children studied by McCarthy, in spite of the different procedures used in obtaining the data. However, the frequency with which both subject and verb were omitted leads to speculation regarding the possibility that the high percentage of incomplete sentences for these children may be the result of more rather than less maturity in the use of sentence form. Reference to the original records shows that there is a frequent occurrence of such responses as "whose ferry?", or "no, just tired." or "high as a house." Forms such as these have a grown-up sound. However, if there is any trend with chronological age for the omission of both subject and verb it is toward a decreasing occurrence with advance in age.

Objects and prepositions are not omitted with sufficient frequency to shed light on the reason for the high percentage of incomplete sentences except to indicate that the reason lies elsewhere than in the use of these parts of speech. There are still high percentages for some of the children under the heading *miscellaneous.*

Although a study of omissions calls for the use of considerable judgment on the part of the analyzer, the results of Tables VIII and IX seem to indicate the value of continuing this work until enough data have been accumulated to set into relief any existing trends.

## TABLE IX

NUMBER AND PER CENT OF VARIOUS TYPES OF OMISSIONS
(Based on Total Number of Responses)

| *Subject* | *Age* | *Total No. Responses* | *Total No. Incomplete Sentences* | *Types of Omissions* | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | *Verb* | | *Subject* | | *Both Verb & Subject* | | *Object* | | *Prepositions* | | *Miscellaneous* | |
| | | | | *No.* | *%* | *No.* | *%* | *No.* | *%* | *No.* | *%* | *No.* | *%* | *No.* | *%* |
| Carolina | 38 mo. | 75 | 54 | 3 | 4.0 | 3 | 4.0 | 33 | 44.0 | 0 | 0.0 | 0 | 0.0 | 15 | 20.0 |
| Varney | 40 mo. | 114 | 12 | 5 | 4.4 | 0 | 0.0 | 4 | 3.5 | 0 | 0.0 | 0 | 0.0 | 3 | 2.6 |
| Kim | 42 mo. | 177 | 59 | 13 | 7.3 | 4 | 2.3 | 18 | 10.2 | 1 | 0.6 | 2 | 1.1 | 21 | 11.9 |
| Average | 40 mo. | 122 | 41.7 | 7 | 5.2 | 2.3 | 2.1 | 18.3 | 19.2 | 0.3 | 0.2 | 0.7 | 0.4 | 13 | 11.3 |
| Barnard | 62 mo. | 96 | 21 | 0 | 0.0 | 0 | 0.0 | 17 | 17.7 | 0 | 0.0 | 0 | 0.0 | 4 | 4.2 |
| Frank | 65 mo. | 194 | 56 | 8 | 4.1 | 5 | 2.6 | 30 | 15.5 | 2 | 1.0 | 0 | 0.0 | 11 | 5.7 |
| June | 69 mo. | 213 | 61 | 2 | 0.9 | 3 | 1.4 | 30 | 14.1 | 0 | 0.0 | 0 | 0.0 | 26 | 12.1 |
| Simon | 71 mo. | 279 | 57 | 11 | 3.9 | 3 | 1.1 | 35 | 12.5 | 1 | 0.4 | 0 | 0.0 | 7 | 2.5 |
| Conley | 73 mo. | 175 | 55 | 2 | 1.1 | 4 | 2.3 | 28 | 16.0 | 4 | 2.3 | 0 | 0.0 | 17 | 9.7 |
| Average | 68 mo. | 191.4 | 50 | 4.6 | 2.0 | 3 | 1.5 | 28 | 15.2 | 1.4 | 0.7 | 0 | 0.0 | 13 | 6.8 |
| *Author* | | | | | | | | | | | | | | | |
| McCarthy | 36 mo. | | | | 6.7 | | 3.2 | | | | | | | | 5.3 |
| " | 42 mo. | | | | 6.1 | | 1.8 | | | | | | | | 5.6 |
| " | 54 mo. | | | | 3.0 | | 2.1 | | | | | | | | 3.7 |

See McCarthy—Table XIX (20).

### EXACT REPETITIONS

Exact repetitions have been discussed already under Functional Analysis (see p. 38). In Table IV will be found the per cent of exact repetitions to the total number of responses. Every repetition of a remark, whether that remark was complete, incomplete, or non-verbal, was recorded. Generally speaking, the children in this study show the same trend as do Fisher's (12) toward a decrease in repetition with increase of age; the younger blind children use many more such repetitions than do Fisher's, and the older ones use fewer than do her oldest group.

Although Smith's figures are not directly comparable it is interesting to note that she found a decrease in the number of repetitions per sentence from 23% at 18–29 months, to 3% at 66–72 months (28).

If an analysis for exact repetitions will set forth individual differences, as it seems to do in the results for Varney and June, then it will be worth continuing in future work. However, if such indications of individual differences do not materialize, after this analysis has been made on more subjects and on the same subjects at a few regular intervals, then it should be dropped.

### COMPLEXITY IN SENTENCE STRUCTURE

The next question relates to complexity of sentence structure. Nice (21) (22), Smith (27), McCarthy (20), and Fisher (12) have shown that both complex and compound sentences are used sparingly in the early years and increase somewhat with age. Smith obtained the percentage of compound and complex sentences combined. (28)

McCarthy's more elaborate analysis differentiates the following types of sentence complexity: simple sentence, simple sentence with a phrase, compound sentence, complex sentence, and elaborated sentence. Fisher distinguished between simple, complex, compound, and compound-complex sentences.

Fisher's simple sentences would include those which McCarthy put in a separate class, believing that the additional phrase meant one more step in the complexity of the child's thinking. McCarthy's elaborated sentences might fall under any one of Fisher's last three classes. From the functional point of view McCarthy's division of sentences according to their degree of complexity is probably fully as useful as Fisher's purely structural

analysis. However, because this study is using the more structural form of analysis wherever possible, it is Fisher's classification which is used here.

Although Fisher's subjects used high percentages of simple sentences, the children in this study approach 100% even more closely. Carolina, the youngest, actually achieved it and the next two followed. In the other group, all of whom are older than the oldest of Fisher's subjects, only two make scores lower than hers in her 54–60 months group. With regard to complex sentences the three younger children average only 1.5% with one of them using none at all. However, three of the older children used more complex sentences than do those in Fisher's 54–60 months group. Compound sentences are used very sparingly, the largest percentage being that attained by Simon. The next highest is June's, 2.6%, which is the same as the average for Fisher's 54–60 months group.

TABLE X

NUMBER AND PER CENT OF EACH KIND OF SENTENCE IN TOTAL COMPLETE SENTENCES

| *Subject* | *Age* | *Total Sentences* | *Simple Sentences* | *Complex Sentences* | *Compound Sentences* | *Compound-Complex Sentences* |
|---|---|---|---|---|---|---|
| Carolina | 38 mo. | 17 | 100.0 | 0.0 | 0.0 | 0.0 |
| Varney | 40 mo. | 102 | 98.0 | 2.0 | 0.0 | 0.0 |
| Kim | 42 mo. | 110 | 95.8 | 2.5 | 1.7 | 0.0 |
| Average | 40 mo. | 76.3 | 97.7 | 1.5 | 0.6 | 0.0 |
| Barnard | 62 mo. | 75 | 94.7 | 5.3 | 0.0 | 0.0 |
| Frank | 65 mo. | 138 | 83.3 | 16.0 | 0.7 | 0.0 |
| June | 69 mo. | 152 | 90.8 | 6.6 | 2.6 | 0.0 |
| Simon | 71 mo. | 219 | 76.7 | 17.3 | 4.6 | 1.4 |
| Conley | 73 mo. | 120 | 84.1 | 14.2 | 1.7 | 0.0 |
| Average | 68 mo. | 140.8 | 85.9 | 11.9 | 1.9 | 0.3 |
| *Author* | | *Subjects* | | | | |
| Fisher* | 36–41 mo. | Boys & Girls | 92.04 | 5.46 | 1.68 | 0.3 |
| " | 42–47 mo. | " " | 88.8 | 7.7 | 2.08 | 0.55 |
| " | 54–60 mo. | " " | 84.6 | 12.4 | 2.6 | 0.47 |
| | | | | Complex & Compound | | |
| Smith** | 30–41 mo. | " " | | 6.2 | | |
| " | 42–53 mo. | " " | | 12.5 | | |
| " | 54–65 mo. | " " | | 17.3 | | |
| " | 66–72 mo. | " " | | 17.1 | | |

* Fisher, Table XI (12). Her figures are based on complete sentences only. Figures shown here are comparable with Fisher's.

** Smith (28).

If the percentages for the complex sentences and the compound sentences are combined it is found that only Simon surpasses the average per cents obtained by Smith for her 66–72 months-old subjects.

This study of increase in sentence complexity is interesting, but since no children, blind or seeing, use the complicated forms much and since it does not seem likely that the blind child's ability to express his desires or to ask questions will be affected in any way by the frequency with which he uses complex, compound, and compound-complex sentences, it seems unprofitable to continue this particular type of analysis in the future. The results are incommensurate with the amount of labor required.

### LENGTH OF RESPONSE

The length of response has been studied by Nice (22), Boyd (6), Smith (27), and McCarthy (20). All are agreed that the average length of sentence is an important indication of the child's development in language.

Nice (22) gives a table showing lengths of sentences found by different authors up to 1925. Boyd's daughter had longer sentences, beginning with the age of three, than the averages obtained by McCarthy and Smith through 54 months. In fact, at the age of three years her average sentence length of 6.4 words, was longer than any of the averages for our older group of children.

The four youngest children in the present study have sentence lengths which closely resembles those obtained by McCarthy and Smith. However, by the age of five Boyd's daughter was using sentences that averaged 7.5 words, and at seven her responses averaged 8.2 words. Fisher's five-year-olds used the longest sentences of all.

On the whole, the blind children in this study compare not unfavorably with seeing children in the length of their responses. Since preschool blind children are found who have had no opportunity to develop language until they were three and four years of age, it may be worth while to continue, at least tentatively, this question relating to sentence length as a criterion for judging the speed with which such badly retarded children acquire language facility.

TABLE XI

AVERAGE NUMBER OF WORDS PER RESPONSE OBTAINED BY DIFFERENT AUTHORS FOR VARIOUS AGE LEVELS

| | *Maxfield* | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| *Subject* | *Age* | *Total No. Responses* | *Average No. Words Per Response* | *Age* | *Fisher* | *McCarthy* | *Smith* | *Boyd* |
| Carolina | 38 mo. | 75 | 2.0 | 36 mo. | 5.6 | 3.4 | 3.5 | |
| Varney | 40 mo. | 114 | 4.6 | | | | | |
| Kim | 42 mo. | 177 | 3.4 | 42 mo. | 6.9 | 4.3 | 4.3 | |
| Average | 40 mo. | 122 | 3.3 | | | | | |
| | | | | 5 yrs. | | | | 7.5 |
| Barnard | 62 mo. | 96 | 4.4 | 54 mo. | 9.5 | 4.6 | 4.9 | |
| Frank | 65 mo. | 194 | 5.3 | | | | | |
| June | 69 mo. | 213 | 5.1 | | | | | |
| Simon | 71 mo. | 279 | 5.8 | | | | | |
| Conley | 73 mo. | 175 | 5.1 | 6 yrs. | | | | 7.7 |
| | | | | 7 yrs. | | | | 8.2 |
| Average | 68 mo. | 191.4 | 5.1 | | | | | |

DIFFERENT WORDS TO TOTAL WORDS

The ratio between the number of different words and the total number of words used by a child during his observation period has been figured to see whether it would throw light on the often remarked tendency of blind children to use the same words over and over again. Table XII shows little age trend in the ratios, but two of the children show exceptionally high ratios. Probably

TABLE XII

RATIO NO. DIFFERENT WORDS TO TOTAL NO. WORDS USED

| *Subject* | *Age* | *Ratio* | *Subject* | *Age* | *Ratio* |
|---|---|---|---|---|---|
| Carolina | 38 mo. | 1/2.0 = .50 | Barnard | 62 mo. | 1/2.3 = .43 |
| Varney | 40 mo. | 1/4.4 = .23 | Frank | 65 mo. | 1/4.2 = .24 |
| Kim | 42 mo. | 1/4.7 = .21 | June | 69 mo. | 1/4.5 = .22 |
| | | | Simon | 71 mo. | 1/4.6 = .22 |
| | | | Conley | 73 mo. | 1/4.4 = .23 |
| Average | 40 mo. | .31 | Average | 68 mo. | .27 |

it will be worth while to figure this ratio in connection with some other study which will include a wider range of vocabulary. Previous work on the ratio of different words to total number of words

has been made largely on the basis of the occurrence of different parts of speech. This relates to our next question.

## PARTS OF SPEECH

It would seem that the percentages of the different parts of speech used by the children during their observation periods should indicate something regarding their linguistic development in comparison with that of seeing children. However, the studies made thus far on children with sight have been somewhat disappointing. Most of them have been made on the superior children of the investigators and therefore do not give a picture of usual linguistic development.

In 1915 Bateman (3) published a table summarizing the results of previous studies. Since then, Nice (22) has analyzed carefully the speech of her children and Boyd (6) has studied his daughter's language according to this classification each year from her second to her eighth birthday.

Investigations on groups of children have been reported by Smith (26) (27) in two investigations, and by McCarthy. (19) (20) In this study we have used a slight modification of McCarthy's method of classifying words according to the parts of speech. (Appendix Two) The percentages of the parts of speech have been figured on the basis of the total number of words the child used during the observational period, as well as on his number of different words. (Tables XIII and XIV)

The lack of trend in any one part of speech from the younger to the older children is in line with the findings of Smith who obtained no *significant* differences between age-groups. In general, her figures agree with those of McCarthy in showing a decrease in percentage of nouns with increase in age, as well as a decrease in the number of interjections. For adverbs Smith found a decrease and McCarthy found no indication of a trend. McCarthy's subjects doubled their proportion of adjectives to the total amount of speech between 18 and 54 months. Smith found an increase from year to year for adjectives, also, but not such a decided one. Both authors reported an increase with age for conjunctions, prepositions, and pronouns.

Except for an increase in conjunctions and a decrease in interjections, it cannot be said that the blind children in this study show an obvious trend in the use of a part of speech from year to year. Conjunctions and interjections are used so infrequently that the slight trend manifested by them means little.

However, a few differences do exist between the results for the seeing children in McCarthy's study and the blind children here. These subjects used a smaller proportion of nouns and a slightly larger proportion of verbs, fewer adjectives and many more adverbs, fewer conjunctions and interjections, and about the same number of pronouns and prepositions.

When the proportions of speech are figured on the basis of the number of different words used during the observational period (Table XIV), the smaller proportion of nouns used by the blind children is made more apparent by the fact that the percentages for the *seeing children* have risen considerably over those shown in Table XIII. With the verbs, the percentages for the seeing children remain practically the same but those for the blind are raised a little. The proportion of adjectives is similar for the two groups, but since the proportion of adverbs for the blind children is noticeably increased the much larger percentage of adverbs for the blind in Table XIII is made even more striking in Table XIV. On the basis of the total number of words, the number of pronouns had been similar for the two groups, but on the basis of the number of different words used, the blind children have a much larger proportion of pronouns. Conjunctions, prepositions, and interjections remain about the same.

In analyzing the language of her subjects according to parts of speech McCarthy did not include proper nouns. Because of the fact that the children in this study seemed to be using the names of children and adults frequently, the percentages in Tables XIII and XIV were refigured with a separate heading for proper names. This isolation of the proper names does not seem to contribute anything which cannot be obtained at least as effectively by Fisher's method of recording the frequency of occurrence for the names of children and adults per hour.

The only two headings which seem to offer anything of value are those pertaining to nouns and adverbs. Smaller proportions for nouns may indicate a narrower range of ideas. The larger proportions for adverbs do seem to be related to the many questions asked.

The small proportion of nouns used may be directly related to the occupations of the children during their observational periods. It may be influenced, too, by the number of questions which the children ask, since questions do not contain as many nouns as do declarative statements.

TABLE XIII

PER CENT OF EACH PART OF SPEECH*
(BASED ON TOTAL NUMBER OF WORDS USED)

| *Subject* | *Age* | *Total No. Words* | *Nouns* | *Verbs* | *Adjectives* | *Adverbs* | *Pronouns* | *Conjunctives* | *Prep.* | *Interjections* | *Misc.* |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Carolina | 38 mo. | 147 | 26.5 | 18.4 | 10.2 | 10.2 | 17.0 | 0.0 | 8.1 | 0.7 | 8.9 |
| Varney | 40 mo. | 516 | 14.0 | 33.5 | 13.6 | 8.3 | 24.6 | 0.0 | 6.0 | 0.0 | 0.0 |
| Kim | 42 mo. | 576 | 10.1 | 33.5 | 9.7 | 10.8 | 22.7 | 0.2 | 8.3 | 3.5 | 1.2 |
| Average | 40 mo. | 413 | 16.8 | 28.5 | 11.2 | 9.8 | 21.4 | 0.1 | 7.5 | 1.4 | 3.4 |
| Barnard | 62 mo. | 407 | 14.7 | 30.0 | 12.8 | 13.5 | 22.9 | 0.2 | 4.7 | 1.2 | 0.0 |
| Frank | 65 mo. | 950 | 12.7 | 29.3 | 14.0 | 13.6 | 19.6 | 1.4 | 7.6 | 1.8 | 0.0 |
| June | 69 mo. | 1047 | 13.3 | 24.1 | 18.1 | 14.5 | 21.3 | 1.1 | 4.7 | 0.8 | 2.1 |
| Simon | 72 mo. | 1558 | 11.2 | 28.1 | 12.9 | 13.7 | 23.8 | 2.8 | 6.6 | 0.5 | 0.4 |
| Conley | 73 mo. | 843 | 9.6 | 31.7 | 11.0 | 15.8 | 24.3 | 0.3 | 6.8 | 0.5 | 0.0 |
| Average | 68 mo. | 961 | 12.3 | 28.6 | 18.8 | 14.2 | 22.4 | 1.2 | 6.1 | 1.0 | 0.5 |
| *Author* | | | | | | | | | | | |
| McCarthy** | 36 mo. | | 23.4 | 23.0 | 16.1 | 7.0 | 19.2 | 2.4 | 6.9 | 1.5 | 0.5 |
| " | 42 mo. | | 18.5 | 26.0 | 15.7 | 7.8 | 20.3 | 2.3 | 6.3 | 2.0 | 0.8 |
| " | 54 mo. | | 19.3 | 25.1 | 15.2 | 7.0 | 20.5 | 3.8 | 7.1 | 1.2 | 0.8 |

* Proper names excluded for comparison with McCarthy. (20).
** Figures for boys and girls combined.

TABLE XIV

PER CENT OF EACH PART OF SPEECH*
(BASED ON NUMBER OF DIFFERENT WORDS USED)

| *Subject* | *Age* | *Total No. Different Words* | *Nouns* | *Verbs* | *Adjectives* | *Adverbs* | *Pronouns* | *Conjunctives* | *Prep.* | *Interjections* | *Misc.* |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Carolina | 38 mo. | 75 | 26.7 | 17.3 | 12.0 | 12.0 | 12.0 | 0.0 | 5.3 | 1.4 | 13.3 |
| Varney | 40 mo. | 114 | 21.9 | 31.6 | 9.7 | 19.3 | 14.0 | 0.0 | 3.5 | 0.0 | 0.0 |
| Kim | 42 mo. | 121 | 22.3 | 33.9 | 11.6 | 9.9 | 11.6 | 0.8 | 4.1 | 4.1 | 1.7 |
| Average | 40 mo. | 109 | 23.6 | 27.6 | 11.3 | 13.7 | 13.5 | 0.3 | 4.3 | 1.8 | 5.0 |
| Barnard | 62 mo. | 145 | 26.2 | 26.9 | 11.7 | 18.6 | 10.4 | 0.7 | 4.1 | 1.4 | 0.0 |
| Frank | 65 mo. | 225 | 16.5 | 30.7 | 13.3 | 21.8 | 8.4 | 1.8 | 4.4 | 3.1 | 0.0 |
| June | 69 mo. | 228 | 26.3 | 27.6 | 14.9 | 13.2 | 10.9 | 1.8 | 2.6 | 1.8 | 0.9 |
| Simon | 71 mo. | 334 | 27.2 | 30.5 | 12.9 | 15.6 | 7.8 | 1.2 | 2.7 | 1.2 | 0.9 |
| Conley | 73 mo. | 181 | 16.8 | 31.9 | 14.7 | 20.9 | 10.5 | 0.5 | 3.7 | 1.0 | 0.0 |
| Average | 68 mo. | 223 | 22.6 | 29.5 | 13.5 | 18.0 | 9.6 | 1.2 | 3.5 | 1.7 | 0.4 |
| *Author* | | | | | | | | | | | |
| McCarthy | 36 mo. | | 40.9 | 26.2 | 12.8 | 6.4 | 6.2 | 0.7 | 4.0 | 1.7 | 1.2 |
| " | 42 mo. | | 41.4 | 26.1 | 11.3 | 7.7 | 5.5 | 1.4 | 3.8 | 1.8 | 1.0 |
| " | 54 mo. | | 38.8 | 25.5 | 13.4 | 7.4 | 5.7 | 1.7 | 3.2 | 2.5 | 1.8 |

* Proper names excluded for comparison with McCarthy. (20).

The study of proportionate parts of speech in young children is not as remunerative, psychologically, as might be expected, and it does not seem to contribute enough to this study to compensate for the amount of time which it takes. A further reason for not using this procedure is that the assignment of words must depend so often upon the subjective judgment of the analyzer. This is especially true of the single-word sentences for the younger children.

It will be necessary to compare the range of ideas of blind children with that of seeing children by some other means than through obtaining ratios between the number of different words they use to their total number of words, or by studying their proportionate parts of speech.

## SUMMARY

In deciding what questions shall be retained for future work it is necessary to keep one thing in mind. The mere fact that the method chosen for obtaining information on a given question does show some slight differences between the blind and the seeing is not in itself sufficient to justify keeping the question. The importance of the information disclosed and the amount of clerical work required for obtaining it must both be considered, since the labor involved in accumulating data on any longitudinal study cannot fail to be taxing.

Only two of the seven questions in this section contribute enough so that they are unqualifiedly worth retaining. These are

What proportion of the child's remarks is complete, what incomplete, and what non-verbal?

In his incomplete sentences what are the omissions?

Two others should be retained tentatively:

How much does he indulge in exact repetition of whole remarks?

How do his responses compare in length with those of seeing children?

The question regarding complexity of sentence structure discloses some differences but the results are not worth the time and effort required to obtain them. Neither are the questions relating to vocabulary extent and parts of speech sufficiently contributive to justify their continuance.

# VIII. SPECIAL QUESTIONS

## QUESTIONS

1. What is the child's use of sensory terms?
   a. Does he have a tendency toward using the terminology of the seeing?
2. What use does he make of spatial and temporal terms?
3. Does an analysis of the child's activity terms indicate anything significant?
4. Does his use of conjunctions and adverbs indicate anything?
5. Are there evidences of inhibiting factors, such as fears, which might interfere with personality or speech development?

All but the fourth question touch upon subjects which have been controversial among workers for the blind for many years. There has been a little experimental work with a few older children and adults. So far as can be discovered, however, no experimental work has been done with preschool visually-handicapped children on these topics.

## SENSORY TERMS

There is a tendency among some blind people to use visual terms freely, and this has led to criticism or to wonder among their seeing acquaintances, according to the attitude and past experience of the listener. Undoubtedly, some of the blind do use visual terms for the sake of effect. Others, however, do so quite unconsciously and naturally for the simple reason that they lost their sight after years of visual experience and consequently still have visual memory and imagery. There are others who have been without sight since their preschool years yet who nevertheless use visual terms legitimately because of the fact that each of these terms has its own meaningful character and feeling-tone for them. Probably, although it would be hard to verify, these blind people knew their colors at the early ages of three, four, or five and had developed such definite likes and dislikes regarding them that characteristic feeling-tones have carried over through the years, however radically the actual imagery may have changed.

It would be interesting to discover, if we could, whether preschool blind children pick up from the seeing people around them visual terms which can have no direct meaning for them. If this

is true, are these terms treated by the child as part of a name, as for instance, *Little Red Hen,* or are they used indiscriminately? Do the preschool children who have had sight for a few years continue using color and other visual terms after they have lost their sight? Also, it would be interesting to know whether small blind children make use of other sensory terms as descriptive substitutes for those which would be used by children with sight.

In this study any term has been considered a sensory term which indicates reaction to sensory stimuli, i.e., noise, soft, feel, smell, thirsty. In Table XV will be found the number of visual and other sensory terms used by the different children and the per cent of total responses containing such terms.

Of the three youngest children two have been totally blinded from birth and the other has probably had no sight since his first year. One of them uses one visual term, *brown,* but it seems to be part of a name, from the child's point of view. He was asking for the *brown doggie.* It is doubtful if this child, Kim, would have known the color *brown* by name even if he had seen.

The visual responses among the older children are interesting. Although Barnard never saw he used two visual terms; yet Conley, who had good sight in one eye until he was about four and a half years old, and who knew all of his colors, used none. That Conley had not lost all interest in color was manifest from the concern he felt about the color of a new glass eye.

The one sensory term Conley used which might have been listed as visual is the word *see.* This has been placed under the *Other* column because of the fact that he used it as synonymous with *feel.* So often, people with sight employ the verb *to see* in the general sense of *consider* or *examine* that the blind have almost universally adopted this generalized use and have even specialized it to mean *feel* or to *examine with the hands.* In all of the records, therefore, the verb *to see* has been listed under *Other Sensory Terms,* except in the case of June who used the past tense three times in what seemed to be definitely visual ways. June had been losing her sight gradually and it may be that she could still distinguish strong color at the time of the observational record.

Barnard's visual terms consisted of the word *pink* which he used in speaking about "nice pink cheeks." Obviously, it is the adult phrase which carries meaning for him rather than the single word *pink.* (It would be interesting to know whether or not this phrase stands in his mind for cold, tingling cheeks.)

## TABLE XV

### Number of Sensory Terms Used

| *Subject* | *Age* | *Total No. Responses* | *Total Sensory Terms* | | *Visual Terms* | | *Other Terms* | |
|---|---|---|---|---|---|---|---|---|
| | | | *Number* | *% of Total Responses* | *Number* | *% of Total Responses* | *Number* | *% of Total Responses* |
| Carolina | 38 mo. | 75 | 6 | 8.0 | 0 | 0.0 | 6 | 8.0 |
| Varney | 40 mo. | 114 | 10 | 8.8 | 0 | 0.0 | 10 | 8.8 |
| Kim | 42 mo. | 177 | 14 | 7.9 | 1 | 0.6 | 13 | 7.3 |
| Average | 40 mo. | 122 | 10 | 8.2 | 0.3 | 0.2 | 9.7 | 8.0 |
| Barnard | 62 mo. | 96 | 12 | 12.5 | 2 | 2.1 | 10 | 10.4 |
| Frank | 65 mo. | 194 | 34 | 17.5 | 0 | 0.0 | 34 | 17.5 |
| June | 69 mo. | 213 | 17 | 8.0 | 4 | 1.9 | 13 | 6.1 |
| Simon | 71 mo. | 279 | 15 | 5.4 | 0 | 0.0 | 15 | 5.4 |
| Conley | 73 mo. | 175 | 5 | 2.9 | 0 | 0.0 | 5 | 2.9 |
| Average | 68 mo. | 191.4 | 16.6 | 9.3 | 1.2 | 0.8 | 15.4 | 8.5 |

Barnard's use of the word *pink* and Kim's use of the word *brown* show how easy it is for blind children to acquire visual terms. Whatever may be true of older blind people, in children of this age such visual terms seem to be useful parts of larger concepts.

With regard to other sensory terms, curiously enough the five older children use them in decreasing amounts with increase in chronological age. Out of a total of 83 words indicating verbal expression of sensory reaction, the words *see, look,* and *show* were used 22 times by the children in a kinesthetic rather than a visual sense. This seems to give evidence that the children have grasped the generalization which lies behind the seeing person's use of the term; that is, the general concept of examination and of consideration, by whatever means, of the object in hand.

In his study of the language of seeing kindergarten children Rugg found only .83% of responses which were conditioned by the physical sensations of sight, touch, smell, and hearing. (25)

In writing about the language development of his son who was blind until the age of 16 months, Bean speaks of the boy's reactions to sensory experiences, before and after the operation which gave him sight. (4) He found that as his son's vision improved his interest in sound diminished until the novelty of seeing things had worn off. Then his already established habit of attending to other types of sensory experience made him become satisfied with any visual impression just so long as it was sufficient to let him know that the object was of an old or new kind. Often, he made no use of visual impressions. Nearly 90% of the child's vocabulary, before his operation, was composed of ideas derived from tactual, auditory, gustatory, and motor senses, and of a few verbal ones standing for light and color. After his operation, visual terms multiplied in his vocabulary more rapidly than did those pertaining to the other senses.

For this study an attempt was made to subdivide the words which have been placed in the *Other Sensory Terms* column in order to find which fields were represented most frequently. Auditory terms came first in number. If the words *see, look,* and *show* are included as kinesthetic terms then this field comes second in frequency.

The separation of the visual terms from the others did not present many difficulties. However, trying to draw distinctions between the other fields proved to be more of a problem than had been

anticipated, partly because of the fact that many words cover sensory experiences from different fields, even for the seeing, and partly because the scorers frequently found themselves influenced by what the child did in connection with his use of a term. Since the visual terms can be separated from the others with reasonable accuracy and since this process would not require an excessive amount of time, the question relating to sensory terminology will be re-worded so as to specify *visual* terms and will be continued for further study, at least tentatively.

### TEMPORAL AND SPATIAL TERMS

For the blind preschool child the development of spatial and temporal orientation is far from a simple matter. The seeing adult acquires so easily a working relationship between visual perception and temporal and spatial concepts that he does not realize the handicap imposed upon small blind children by their lack of sight in acquiring temporal and spatial orientation.

In the Introduction two paragraphs have been quoted from Cutsforth (8) which show graphically the importance of vision in the development of the small child's spatial concepts.

Director Siegfried Altmann in a paper on psychological problems of the preschool blind child (1) comments on the fact that the comprehension of spatial relationships which can be obtained through the localization of sounds and through the formation of connections between seeing and hearing is lacking in the blind child.

Just here lies the chief barrier to the normal development of a blind baby. Until he becomes conscious of the fact that there are things in the distance which are desirable he will not attempt to creep or walk across the floor, through what is to him unknown and uncertain territory. The blind baby's needs for physical activity can be satisfied fully as well, from his point of view, through the use of unpleasant mannerisms and bad habits as by investigating the unknown.

The problem of spatial orientation in the small blind child is sufficiently important to call for a separate study and it seems likely that temporal orientation and sound localization should be included with it. The investigation of the occurrence of temporal and spatial terms in the language of blind children who have already achieved an entirely satisfactory degree of orientation, as have those in this study, can make only a slight contribution to the whole problem. However, it has seemed worth while to find out how generally

such terms were used by them in their spontaneous conversation and what the frequencies might be in relation to the total number of responses.

For these eight children there appears to be an increase in the use of temporal and spatial terminology with age. Although no exactly parallel work with seeing children has been found, the results in Table XVI indicate that the blind subjects used these relational terms in a large proportion of responses. This is in keeping with the high percentage of questions they asked. Spatial phrases occurring among the three younger children included *in there* and *over here.* Their sum total of temporal phrases is covered by *any more* (meaning any longer), *now, again,* and *stay.*

In Table XVI any word or group of words standing for a temporal or spatial concept was considered a relational term, as for instance, *over* or *out there.* In the older group the children used many more temporal terms, including *in summer, when, 'till, yet. as fast as, once used to.* The spatial terms were numerous and included *this way, down lower, backwards, what way,* and *other side.*

For the purpose of determining which were the most frequently used spatial words, whether they occurred singly or in phrases, the spatial words were taken out of the phrases and assigned to their own columns. For instance, the spatial import of the phrase *over there* was disregarded and the two words were considered separately. On this basis it was found that the three most frequently used words out of a total of 424 were *where* 42 times, *here* 56, and *in* 64.

In their Psychology of Preschool Children, Baldwin and Stecher reported an experiment in which they found, through obtaining children's answers to questions, that more than half of their 40 subjects three years of age or younger knew whether it was *morning* or *afternoon,* or whether it was *tomorrow* or *today.* (2)

Rugg reports in his study of the spontaneous speech of kindergarten children only .16% of their speech as being verbalized perception indicating recognition of time and space. (25) In comparison with this figure the blind children would seem to use such verbal perception with a high degree of frequency for their physical age.

Grigsby says that vocabulary relating to time appears before the concepts themselves are clearly defined, that true time conception does not come until after the ego-stage of causal relationship, because it involves a relation between two incidents exclusive of self.

## TABLE XVI

### Number of Relational Terms Used

| *Subject* | *Age* | *Total No. Responses* | *Total Relational Terms* | | *Temporal Terms* | | *Spatial Terms* | |
|---|---|---|---|---|---|---|---|---|
| | | | *Number* | *% of Total Responses* | *Number* | *% of Total Responses* | *Number* | *% of Total Responses* |
| Carolina | 38 mo. | 75 | 6 | 8.0 | 0 | 0.0 | 6 | 8.0 |
| Varney | 40 mo. | 114 | 26 | 22.8 | 2 | 1.8 | 24 | 21.1 |
| Kim | 42 mo. | 177 | 52 | 29.4 | 5 | 2.8 | 47 | 26.6 |
| Average | 40 mo. | 122 | 26 | 20.1 | 2.3 | 1.5 | 25.7 | 18.6 |
| Barnard | 62 mo. | 96 | 31 | 32.3 | 10 | 10.4 | 21 | 21.9 |
| Frank | 65 mo. | 194 | 82 | 42.3 | 15 | 7.7 | 67 | 34.5 |
| June | 69 mo. | 213 | 122 | 57.3 | 19 | 8.9 | 103 | 48.4 |
| Simon | 71 mo. | 279 | 157 | 56.3 | 30 | 10.8 | 127 | 45.5 |
| Conley | 73 mo. | 175 | 70 | 40.0 | 25 | 14.3 | 45 | 25.7 |
| Average | 68 mo. | 191.4 | 92.4 | 45.6 | 19.8 | 10.4 | 72.6 | 35.2 |

(14) According to this, no preschool child could have a true concept of time. He can have a working appreciation of time, however. It is a matter of importance to the blind child for him to know the meaning of such terms as *yesterday* and *tomorrow, up* and *down, before* and *after,* prior to his entrance into kindergarten or first grade. Yet many of them are not familiar with such elementary spatial and temporal terms as these when they arrive at schools or classes for the blind. The result is that the children are bewildered and confused in trying to follow directions.

The study of temporal and spatial terms in the spontaneous language of the preschool blind child can do little more than touch the fringe of the whole problem relating to the temporal and spatial concepts of the blind. Nevertheless, it does have a contribution to make. It can give assurance that the particular children being studied are able to use intelligently the terms they will need during their first year in school. As records accumulate in future studies evidence will be obtained also regarding the ages at which these terms and phrases enter the vocabulary of blind and low-visioned children.

For this question, as well as the preceding one, however, it will be necessary to decide upon the specific words and phrases to be studied if ambiguities and subjective judgments are not to color the results.

### ACTIVITY TERMS

Comment has been made already on the tendency toward inactivity observable in many blind children when they enter school. It would be helpful if a study of their spontaneous language could distinguish this tendency with enough certainty so that a passive child's growing interest in activity would be revealed during the progress of a longitudinal study. Then we should have found a valuable aid in the study of this particular group.

In her work at the Bureau of Educational Experiments Farber had studied the spontaneous language of eight seeing children from the point of view of the I-Activity and You-Activity it revealed. (11) In doing this she judged the children's responses entirely on the basis of their function. A statement was classified as representing I-Activity if it related to what the child was doing or about to do, or if it concerned some activity in which he took part. We-Activity was included with I-Activity. You-Activity is equally broadly interpreted. Both classifications were subdivided, the first into declara-

tives, interrogatives, and optatives, and the second into declaratives, interrogatives, and imperatives.

Although Farber's general idea has been adopted of analyzing the child's language to pick out his activity responses, it was felt that a more objective method of procedure was advisable.

*Activity terms* have been noted, rather than whole responses, and the proportional relationship of these to the total number of remarks has been obtained. (Table XVII). Since the activity terms of these children proved to be verbs, exclusively, those having *I* or *We* as subject come under *Self* and those having other persons as subject come under under *Other Person,* whether the other person is expressed in the second or third person, or whether there is one or more than one. A third column has been added in order to see whether much attention is paid by the children to the activity of objects without relation to the activity of human beings, for instance, "The beach wagon is going to town."

For the group as a whole approximately a third of the responses contained activity terms, those for two of the children reaching nearly 50%. In the older group, if Frank's record is omitted, there is manifested a trend toward more activity terms with increased age.

With regard to activity terms relating to the self, there is no sure trend from age to age, although the averages for the two groups indicate greater use of such terms by the young subjects. Reference to the activity of other persons shows a regular increase with age if Varney's record is omitted. Except for Frank's record an increase with age appears also in the references to the activity of things. The increase in the number of terms relating to the activity of other people is interesting in view of the fact that a decreasing use of commands was found in Table III.

The contribution of this particular question is somewhat obscure, but since trends do appear in the use of activity terms (Table XVII) its tentative retention in future work seems practicable. The present figures do not give the desired information regarding a blind child's tendency toward passivity, and possibly toward expecting others to act for him. However, Table XVII does show an increase in the number of activity terms as a whole and this may indicate an increase in actual physical alertness. The fact that these subjects were the most normal available may tend to conceal the contribution of this particular question in differentiating these children from those who are out of the ordinary in behavior.

TABLE XVII

NUMBER OF ACTIVITY TERMS USED

| *Subject* | *Age* | *Total No. Responses* | *Tot. Activity Terms* | | *Reference to* | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | *Number* | *% of Total Responses* | *Self* | | *Other Person* | | *Thing* | |
| | | | | | *No.* | *%* | *No.* | *%* | *No.* | *%* |
| Carolina | 38 mo. | 75 | 10 | 13.3 | 8 | 10.7 | 2 | 2.7 | 0 | 0.0 |
| Varney | 40 mo. | 114 | 55 | 48.2 | 34 | 29.8 | 20 | 17.5 | 1 | 0.9 |
| Kim | 42 mo. | 177 | 64 | 36.2 | 54 | 30.5 | 8 | 4.5 | 2 | 1.1 |
| Average | 40 mo. | 122 | 43 | 32.6 | 32 | 23.7 | 10 | 8.2 | 1 | 0.7 |
| Barnard | 62 mo. | 96 | 24 | 25.0 | 15 | 15.6 | 8 | 8.3 | 1 | 1.0 |
| Frank | 65 mo. | 194 | 66 | 34.0 | 25 | 12.9 | 21 | 10.8 | 20 | 10.3 |
| June | 69 mo. | 213 | 61 | 28.6 | 22 | 10.3 | 33 | 15.5 | 6 | 2.8 |
| Simon | 71 mo. | 279 | 109 | 39.1 | 44 | 15.8 | 44 | 15.8 | 21 | 7.5 |
| Conley | 73 mo. | 175 | 86 | 49.1 | 31 | 17.7 | 35 | 20.0 | 20 | 11.4 |
| Average | 68 mo. | 191.4 | 69.2 | 35.2 | 27.4 | 14.5 | 28.2 | 14.1 | 13.6 | 6.6 |

### CONJUCTIONS AND ADVERBS, AND INDICATIONS OF FRUSTRATIONS

The last two questions reveal nothing, in this study, and the chances are slight that they would have more to offer in future work. The conjunctions and adverbs were included because Fisher had listed them in her data although she did not use them in her monograph. What contribution they might make to a better understanding of the blind or low-visioned child's language development was not clear but since it took little time to list them Table XVIII was figured. The table shows that the young children make no use of interrogative adverbs other than *where.* Among the older children *where* is used often, with *how* and *why* as close seconds. The first position in frequency obtained by *where* is in keeping with the findings of Smith who reports that this interrogative adverb is the only one to occur more than 100 times in the 124 one-hour conversations of her first study. (27)

The averages for the adverbs *where, why, how,* and *than* are raised considerably by their frequent use by one child, June.

It is interesting to note here the findings of Piaget regarding the relative frequency of occurrence of the interrogative words and phrases reported by him in his chapter on The Questions of a Child of Six. In 360 simple questions the frequencies were as follows: why, 185; how, 38; is, 67; what is, 77; who is, 5; who, 5; where, 7; when, 6; how many, 10.

The records disclose nothing regarding the presence of fears or other sources of frustration. This may be peculiar to this particular group of subjects, but observation of other blind and low-visioned children at the Arthur Home leads one to the tentative conclusion that they are not yet able to verbalize their feelings and emotions. Their usual reaction to the frequent experience of getting lost is likely to take the form of wandering about unconcernedly until they come into contact with something familiar, of crying, or of having temper tantrums. None of these modes of expression can be identified with certainty in the language records even when reference is made to the Stimulus column.

### SUMMARY

Since a study of the visual terminology in the spontaneous language of small blind children promises something of interest, the question relating to sensory terms will be kept in this form: Does the child have a tendency toward using the terminology of the seeing?

TABLE XVIII

CONJUNCTIONS AND ADVERBS*

| *Subject* | *Age* | *Total Used* | *where* | *when* | *why* | *how* | *because* | *while* | *but* | *if* | *then* | *until* | *so* | *after* | *than* | *or* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carolina | 38 mo. | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| Varney | 40 mo. | 4 | 3 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Kim | 42 mo. | 5** | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Average | 40 mo. | 3.3 | 2.7 | 0 | 0.3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.3 | 0 | 0 | 0 |
| Barnard | 62 mo. | 8 | 3 | 3 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| Frank | 65 mo. | 23 | 7 | 2 | 3 | 0 | 2 | 0 | 2 | 2 | 1 | 1 | 1 | 0 | 0 | 2 |
| June | 69 mo. | 65 | 18 | 4 | 10 | 14 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 13 | 4 |
| Simon | 71 mo. | 57 | 3 | 7 | 5 | 7 | 11 | 0 | 3 | 11 | 7 | 0 | 1 | 1 | 1 | 0 |
| Conley | 73 mo. | 38 | 6 | 2 | 6 | 13 | 7 | 1 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 0 |
| Average | 68 mo. | 38.2 | 7.4 | 3.6 | 5 | 6.8 | 4 | 0.2 | 1 | 3 | 1.8 | 0.2 | 0.6 | 0.4 | 3 | 1.2 |

* See Fisher p. 15. (12).

** 50 minutes' observation—figures have been adjusted on basis of 1 hr.

The question regarding the use of spatial and temporal terms will be kept for the purpose of determining the ages at which we can expect to find blind children using, or ready to use, those terms which they need most upon their entrance into schools and classes for the blind. For this question, as well as the first, it will be necessary to decide on definite lists of words and phrases regarding which information is wanted.

The question pertaining to the child's use of activity terms will be kept tentatively, in the hope that when it is used with a wider variety of children its contribution, or lack of it, will be better defined.

The question relating to conjunctions and adverbs yields little and will be dropped. The same thing is true regarding the question about frustrations and fears.

## IX. CONCLUSION

Because of the small number of preschool visually-handicapped children who are available for study at any one time, and because of the diversity of characteristics among these few children, it seems essential to approach their developmental problems through the medium of a group of related longitudinal investigations with which may be integrated supplementary cross-sectional studies. Because of the fact that the field is new, an introductory cross-sectional study, preceding the initiation of such longitudinal research, appears advisable in order to economize time and effort.

The present study has been conducted for the purpose of choosing methods and procedures for future work on the *spoken language of preschool visually-handicapped children.*

For the *collection of data,* the verbatim-report form of the observational method has been used. The fact that this method calls for no adaptation in its application to blind and low-visioned children makes possible the direct comparison of results with those obtained on seeing children.

Likewise, in the *treatment of the data* procedures have been chosen from studies on seeing children so as to make comparisons possible. The technique tried by Dr. Mary Shattuck Fisher in her Language Patterns of Preschool Children seems practicable for the purposes of this study, and for that reason her work has been drawn upon heavily. Procedures have been adopted from other authors, especially from Dr. Madorah Smith in her Investigation of the Development of the Sentence and the Extent of Vocabulary in Young Children, and her Study of Some Factors Influencing the Development of the Sentence in Preschool Children, and from Dr. Dorothea McCarthy's Language Development of the Preschool Child. A few items were added which seemed to promise something toward a better understanding of preschool visually-handicapped children.

1. Objective treatment was necessary because of the fact that more than one observer and recorder would be contributing toward the completion of later studies. It is recognized that the subjective judgment of the scorer and the accuracy of recording of the observer cannot but introduce some factors of uncertainty. However, it is felt that the chosen techniques have sufficient objectivity

so that in spite of their unavoidable faults they will be effective in building a useful body of knowledge.

2. Because of the tedium which is inherent in the routine collection and treatment of data over a long period of time, and because of the expense involved, it is necessary to keep in mind the time factor. An item must contribute more than a modicum of information if it is to be retained in a longitudinal study. In other words, the results must be commensurate with the cost. Each item in this study has been considered from this point of view. Some will be used in future work definitely, others will be kept tentatively, and still others will be discarded.
3. The collection of data on a physically-handicapped group is made more valuable through comparison with similar data on the unhandicapped. In this case, comparisons have been made wherever possible with results obtained in studies on seeing preschool children. In order to set forth more definitely whatever difference may exist, totally blind children only have been used in this study. However, during the course of the longitudinal research data will be collected on all visually-handicapped preschool children who are not definitely feebleminded and who are obtainable for study. It may be advisable, even, to include fully seeing children in order that information may be obtained on subjects of corresponding socio-economic and intelligence levels.

Because of the fact that this field is new, so far as studies on the visually-handicapped preschool child are concerned, it has been thought advisable to state *questions* rather than *hypotheses.* It is hoped that this interrogative form will play its part in keeping the research workers in a questioning and critical state of mind toward the value of the various items.

The twenty-six questions which were considered in this study were arranged in four groups as follows:

1. Those relating to the functional analysis of the child's spontaneous language.
2. Those relating to additional social indices to be found in his language.
3. Those relating to the constructional analysis of his language.
4. Those relating to special questions pertaining to his spontaneous language which, it was thought, might have some-

thing to offer toward the better understanding of the blind child.

Thirteen questions have been retained definitely:

1. Functional Analysis
   a. What percentage of the child's remarks is about himself?
   b. What percentage is about other persons?
   c. What percentage is about things?
   d. What is the child's interest in himself as compared with his interest in other persons and objects—his degree of egocentricity?
   e. What percentage of the child's language is composed of questions?
   f. How much does he indulge in commands, whether to himself, to other persons, or to things?
   g. How much exact repetition does he use of what he says himself?
2. Social Indices
   a. How much of the child's speech is made up of emotionally-toned responses?
   b. How much does the child use the names of children and adults?
3. Sentence Construction
   a. What proportion of the child's remarks is complete, what incomplete, and what non-verbal?
   b. In his incomplete sentences what are the omissions?
4. Special Questions
   a. Does the child have a tendency toward using the terminology of the seeing? (This was a sub-question under, "What is the child's use of sensory terms?")
   b. What use does he make of spatial and temporal terms? (Probably)

The following four questions have been retained tentatively:

1. Social Indices
   a. How much use does the child make of negative statements? (The original wording of this question was, "What indication does his speech give regarding his negativism? Does his use of negative statements and *no* answer this question?")
2. Sentence Construction
   a. How much does he indulge in exact repetition of whole remarks? (This may be dropped under Sentence Con-

struction but will be continued under Functional Analysis.)

b. How do the child's responses compare in length with those of seeing children?

3. Special Questions
   a. Does an analysis of the child's activity terms indicate anything?

The following nine questions have been dropped:

1. Functional Analysis
   a. How much interest does the child show in dramatic imitation?
   b. How much word play does he indulge in?
   c. How much of his language consists of statements?
2. Social Indices
   a. What tendency does he show toward sharing his experiences with others? Does his use of *we, us,* and *our,* answer this question?
3. Sentence Construction
   a. What about the complexity of the child's sentence structure?
   b. What is the child's range of vocabulary as compared with his general loquacity; that is, what is the ratio of the different number of words he uses to the total number of words?
   c. What is the percentage of the different parts of speech in his total number of words and in his different words?
4. Special Questions
   a. Does the child's use of conjunctions and adverbs indicate anything?
   b. Are there evidences of inhibiting factors, such as fears, which might interfere with personality or speech development?

It has been thought advisable to add one question under Social Indices:

2. b. What is the average number of responses given by the child during one hour (or observational period)?

It is with this group of definitely and tentatively accepted questions that a longitudinal study will be initiated. One problem remains to be solved during the course of the longitudinal experiment, and that relates to the length of the observational period. It is planned that observations will be made during three half-hour

periods, preferably on three successive days. These observations will take place during the free-play period in order that the spontaneous conversation of the children may be recorded.

In this demonstrational study, sex differences have been ignored since only two girls were available and since the eight children varied so much among themselves that sex differences could have little meaning. However, in the longitudinal investigation, these differences will be studied.

Neither have the data been considered in terms of mental age. There are no reliable tests for the youngest children, and for the older, tests were not available for one. The IQ's of the four children who had been given the Hayes-Binet Test ranged from 94 to 142. Although mental ratings will be obtained whenever possible, on the children in the longitudinal study, it is likely that no special investigation will be made of the data in terms of mental age until a number of records have accumulated. Definitely feebleminded children will not be included in the study.

During the course of time a body of information should be available which can guide teachers and guardians in the training of visually-handicapped preschool children.

While this is distinctly a study of method, preparatory to the use of the procedures thus validated by the author and others, a few tentative findings have emerged and should be reported. The functional analysis revealed that from 40 per cent to 50 per cent of the older children's responses were concerned with things. Since this is about twice the percentage shown by Fisher's oldest group, it seems likely that it represents a real difference between blind and seeing children of preschool age.

Taken as a group the blind children asked many more questions than did the seeing, and gave fewer commands. These, too, seem to be distinguishing characteristics.

It is not surprising that a large number of the responses of these blind children were emotionally-toned. Whether or not McCarthy's subjects would have shown as high percentages of emotionally charged speech, if their records had been obtained on spontaneous conversation during free play, cannot be known. However, it is clear that emotionally-toned language is an outstanding characteristic of small children who are without sight.

Probably frequent naming of children and of adults will prove to be a feature of the language of blind preschool children, with the accumulation of future records, as will abundance of speech.

Judging by the results of this study blind children use fewer complete responses, many more incomplete responses, and fewer non-verbal ones than do seeing childen.

Among the Special Questions the one which promises most is that relating to the use of visual terminology. Further study of this may throw light on the visual terms which are used legitimately by the blind with entire intelligibility to the seeing.

It may be that the trends which have appeared in connection with some of the questions will be found to group themselves around some fundamental need of the growing blind child. For instance, it seems reasonable to assume that the totally blind preschool child is satisfying his need for a feeling of security through talking a great deal, asking many questions, and using proper names frequently. These language patterns may become established in and of themselves. At first, however, the trends disclosed by these particular questions probably stand for the blind child's attempt to gain that assurance regarding his environment which seeing children obtain through visual observation.

As another illustration, it may be that the small proportion of egocentric responses used by these children, together with their large percentage of incomplete responses, may indicate more, rather than less, social maturity, when one compares them with seeing children. If it does indicate more social maturity, the reason may lie in their necessary dependence on others and in the consequently large amount of practice which they have in social situations. The large number of questions may fit into this picture of social maturity also.

However, until more data are available we can do nothing but make assumptions regarding what these trends may indicate. Yet they do point out the uses to which material such as this can be put in establishing an understanding of the visually-handicapped preschool child which will help us to guide him in his development.

This investigation has given results which are so much more definite and informative than had been anticipated that it lends interest to the further work which is being planned. Once the special characteristics and needs of preschool visually-handicapped children are recognized, it should be possible to give him the particular training he should have during his first few years of life if he is to meet his seeing friends and relatives on equal terms as he grows older.

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# APPENDIX ONE

## BRIEF HISTORY OF THE CHILDREN IN THIS STUDY

### *Discussion*

The eight subjects of this study form as homogeneous a group as is likely to be found among preschool visually-handicapped children. None of them is partially-seeing and none is feebleminded. However, reference to the brief histories given below will indicate how many variables remain, even though a few items likely to affect the behavior of some of the children are not included because of the impossibility of gathering the information.

For some of the children Hayes-Binet mental ratings have been obtained. Probably for the five- and six-year-olds the intelligence quotients do indicate the child's degree of mental ability, especially when the results of two or three tests are recorded. With children three years of age the Hayes-Binet Test cannot be considered reliable because of the fact that not enough normal blind children at that age level were available for standardizing purposes. The children for whom we do not have Hayes-Binet ratings have given definite developmental evidence of normality. The child whose mentality is probably the lowest in the group is Carolina, whose Hayes-Binet rating is 89, on the one test given her.

For five of the children Social Maturity ratings were obtained, following the 1934 tentative series of the Doll Social Maturity Scale. This Scale promises well for use with blind and low-visioned children. Few adaptations are necessary and it can be administered frequently enough to show the progress of an under-privileged blind child in Social Maturity as the result of improved health and training. These particular ratings, however, must be looked upon as tentative.

Among the eight children, five have been blind from birth, or soon thereafter, as the result of ophthalmia neonatorum; one, now totally blind from buphthalmos, has been losing her sight gradually since about her first birthday; another, now 71 months old, has been totally blind since 22 months as the result of measles; the eighth lost the sight of one eye in an accident at about 18 months of age and the other eye in a second accident at four and a half years.

*Abbreviations*

The following abbreviations have been used:

ASH—Arthur Sunshine Home and Nursery School for the Blind.
BN—Boston Nursery for Blind Babies.
Soc. Mat.—Social Maturity Scale.
Obs.—observed.
Adm.—admitted.

*Brief Histories*

*Carolina:* 38 months. Adm. ASH 3/28/35.
Obs. 1/27/36, 11:00–11:30.
1/29/36, 10:40–11:10.

Mental ability—Hayes-Binet IQ approximately 89.

Soc. Mat.—Social Quotient 62. It is expected that she will advance at a more rapid rate than the Social Quotient would indicate.

Colored girl of South Carolina parentage.

Eye condition: Totally blind from ophthalmia neonatorum a few weeks after birth. Bare possibility of perception of strong light.

Additional notes: Is twin of a still-born brother. Parents have had seven children, five of them now dead. Talked some when she came but for a number of months her speech was limited and unintelligible to a Northerner. Now speaks fairly clearly, sometimes bringing phrases out of her preinstitution experience, such as "You'd better smack him one," or others less printable.

*Varney:* 40 months old. Adm. BN 9/13/35.
Obs. 2/4/36, 10:30–11:00.
2/6/36, 11:20–11:50.

Mental ability.—Apparently normal.

Soc. Mat.—Social Quotient 103. This may decrease as he grows older but he will probably continue to develop at approximately a normal rate. Very active child, uses considerable initiative in play activities.

Eye condition: Totally blind, except for possible light perception in left eye. Leucoma in both eyes resulting from gonorrheal infection. Is said to have had a little sight until he had measles.

*Kim:* 42 months. Adm. ASH 7/19/35.
Obs. 10/11/35, 10:40–11:30.

Mental ability.—Apparently normal.

Soc. Mat.—Social Quotient 63. Definitely retarded in self-help. More advanced in socialization, occupation, and locomotion. Has shown definite improvement in social competence since admission to the Home and would be expected to continue.

Eye condition: Totally blind from ophthalmia neonatorum shortly after birth. Eyes retracted under supraorbital bone. Appears to have some light perception when he pushes up his eyelids.

Additional notes: Comes from Pennsylvania mountain mining family; squalid conditions; five siblings. He was so negativistic toward adults when he came that he fought all personal contacts, making training difficult. After three months still refused to cooperate on a test but was beginning to play with the other children and would come to adults voluntarily, when not asked. Talks clearly enough so that this record could be made. Fearless in walking, climbing, investigating.

*Barnard:* 72 months. Adm. BN 9/8/34.

Obs. 2/4/36, 9:55–10:25.
2/6/36, 11:55–12:25.

Mental ability.—Apparently normal.

Soc. Mat.—Social Quotient 100. Has slow, deliberate manner. Cautious, easy-going, imaginative. Uses good reasoning. Gives impression of being rather above the average in intelligence. A few items on the Social Maturity Scale may have been failed because of "no opportunity" due to handicap.

Eye condition: Totally blind from ophthalmia neonatorum.

*Frank:* 65 months. Adm. ASH 11/25/34.

Obs. 5/14/35, 9:05–10:05.

Mental ability: Hayes-Binet IQ's 140 and 142.

Eye condition: Totally blind from ophthalmia neonatorum.

Additional notes: Intelligent family completely wrapped up in Frank. When he came Frank was soft, physically and mentally, and very timid. In four months he was going everywhere independently and *could* do many daring things, if sufficient desire could be stimulated in him. Has excellent reasoning ability and good imagination but until recently he preferred to occupy himself with mere enumeration of objects and events.

*June:* 69 months. Adm. ASH 5/25/31.

Obs. 10/25/35, 11:00–11:30.
10/28/35, 11:00–11:30.

Mental ability.—Hayes-Binet IQ's 92 and 94. On the last test the basal age was four years and the upper limit seven years. Shows good reasoning ability but seems to be slow in comprehending.

Soc. Mat.—Social Quotient 84. Does very well on items of self-help. Social competence will probably reach a practically normal level in spite of her blindness, especially if her eyes are removed.

Eye condition: Totally blind from buphthalmos, except for possible perception of strong light. Sight has gradually diminished from the time she was about one year of age. Eyes and nose run almost constantly. Eyes very painful and until recently very sensitive to light.

Additional notes: Intelligent family consisting of mother and three siblings, all of whom have a reasonably controlled attitude toward June. June's eye condition makes her irritable and subject to frequent temper tantrums. Is underweight in spite of all efforts to build her up.

*Simon:* 71 months. Adm. ASH June, 1932.
Obs. 7/6/35, 2:15–3:15.

Mental ability.—Hayes-Binet IQ's 122 and 118.

Colored boy of New Jersey parents.

Eye condition: Totally blind as the result of measles in June, 1931.

Additional notes: Average family. Stepfather a garbage collector. Simon is unusually well adjusted socially, and is active physically and mentally.

*Conley:* 73 months. Adm. ASH 5/24/34.
Obs. 5/19/35, 9:25–10:25.

Mental ability.—Hayes-Binet IQ's 91, 93, 100.

Eye condition: Totally blind. Sight lost in one eye at 18 months of age and in the other at four years and a half, both from accidents.

Additional notes: No physical handicap other than blindness. The many tragedies in his family during the year and a half preceding his entrance into the Home preyed on his mind and he is too much concerned with death, burial, and the hereafter. Has exceptional motor-manual ability. Rides his tricycle both uphill and down over the grounds at considerable speed. Is determined to dominate, by whatever means, and usually succeeds with the other children. Seems always to be hoping that he will succeed with the staff as well.

# APPENDIX TWO

## STUDY OF LANGUAGE

Name of child SIMON Date 7/6/35

| *Time* | *Place* | *Stimuli* | *Child's Language* |
|---|---|---|---|
| 2:15 | Drive by barn | C. S. and L. getting box to make airplane. | Here I am. Does it float? It's too big. It's as big as anything. |
| | | Carrying box.<br>Something fell out of box. | It's out of box. My side. Mine fell out. (1x) Out of the box. Here it is. I found it on the ground. Wagon box and wagon box. |
| | | Curlie spoke, loudly. | What? (1x) Why do you have to scream at me? I'm not deaf, Curlie. If I was out of here you couldn't hear me. Then you'd have to squeal at me.<br>I am. Ow! Not airplane box. |
| | | Benny has come down. | Benny, how's your sword?<br>Up to the pavilion, cause Curlie is gonna make—Guess what! Dragging against — I'm not dragging. My stick fell. |
| | | C. S. said something about dragging. | I will, cause I—, just fun, fun, fun. No, not gonna turn over a bit. He's gonna keep your sword. Keep your sword, Benny. |
| | | C. S. dropped the box. | Curlie, why, why did you let it down? |
| | Pavilion | | No. I smell the pavilion. I smell the screen, and I smell the door. And here we are up on the cement. And here we are. |
| | | He fell. | Ow! |
| | | | Yes I will. |
| | | Looking for tools. | It is supposed to be somewhere down here. They don't run into it. Here I come, Curlie, if you need me. |
| | | | I put this on the mattress, and nobody will take it. Jimmy fixed it for us. |
| | | | Yup, Jimmy is nice. |

TIME 2:15–3:15

| PECIAL ITEM V | | | | | | | |
|---|---|---|---|---|---|---|---|
| Yes | No | Child | Adult | | I & C Adv | We Us Our | |
| | | | | | | | * One word $R_1$ Wagon box one word |
| | | | | | 3 | | |
| | | CS | | | | | (neg |
| | | | | | 10 | | (neg |
| | | | | | 11 | | |
| | | | | | | | "ow!" |

# APPENDIX TWO

## STUDY OF LANGUAGE

Name of child SIMON Date 7/6/35

| *Time* | *Place* | *Stimuli* | *Child's Language* |
|---|---|---|---|
| 2:15 | Drive by barn | C. S. and L. getting box to make airplane. | Here I am. Does it float? It's too big. It's as big as anything. |
| | | Carrying box. Something fell out of box. | It's out of box. My side. Mine fell out. (1x) Out of the box. Here it is. I found it on the ground. Wagon box and wagon box. |
| | | Curlie spoke, loudly. | What? (1x) Why do you have to scream at me? I'm not deaf, Curlie. If I was out of here you couldn't hear me. Then you'd have to squeal at me. |
| | | | I am. Ow! Not airplane box. |
| | | Benny has come down. | Benny, how's your sword? |
| | | | Up to the pavilion, cause Curlie is gonna make—Guess what! Dragging against—I'm not dragging. My stick fell. |
| | | C. S. said something about dragging. | I will, cause I—, just fun, fun, fun. No, not gonna turn over a bit. He's gonna keep your sword. Keep your sword, Benny. |
| | | C. S. dropped the box. | Curlie, why, why did you let it down? |
| | Pavilion | | No. I smell the pavilion. I smell the screen, and I smell the door. And here we are up on the cement. And here we are. |
| | | He fell. | Ow! |
| | | | Yes I will. |
| | | Looking for tools. | It is supposed to be somewhere down here. They don't run into it. Here I come, Curlie, if you need me. |
| | | | I put this on the mattress, and nobody will take it. Jimmy fixed it for us. |
| | | | Yup, Jimmy is nice. |

NAME: SIMON

ANALYSIS SHEET 1
DATE 7/6/35

TIME 2: 15–3: 15

| No. R. | Time | COMPLETE SENTENCES | | | | | | | | | No. Wds | INCOMPLETE SENTENCES | | | | | | | | | | | | Non Verbal | SPECIAL ITEM V | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Interrogative | | | Imperative | | | Declarative | | | | Interrogative | | | Imperative | | | Declarative | | | Undet. | Wd. Pl. | | No. Wds. | | Neg. St. | Em. Ton | | Yes | No | Child | Adult | | I & C Adv | We Us Our | |
| | | I | II | III | I | II | III | I | II | III | | I | II | III | I | II | III | I | II | III | | | | | | | | | | | | | | | |
| 1 | 2: 15 | | | | | | | 1 | | | 3 | | | | | | | | | | | | | | | | | | | | | | | | |
| 2 | | | | 1 | | | | | | | 3 | | | | | | | | | | | | | | | | | | | | | | | | |
| 3 | | | | | | | | | | 1 | 4 | | | | | | | | | | | | | | | | | | | | | | | | |
| 4 | | | | | | | | | | 1 | 6 | | | | | | | | | | | | | | | | | | | | | | | | |
| 5 | | | | | | | | | | 1 | 5 | | | | | | | | | | | | | | | | | | | | | | | | |
| 6 | | | | | | | | | | | | | | | | | | | | 1(5) | | | 2 | | | | | | | | | | | | |
| 7 | | | | | | | | | | 1 | 3 | | | | | | | | | | | | | | | | | | | | | | | | |
| 8 | | | | | | | | | | R | R | | | | | | | | | | | | | | | | | | | | | | | | |
| 9 | | | | | | | | | | | | | | | | | | | | 1(5) | | | 4 | | | | | | | | | | | | |
| 10 | | | | | | | | | | 1 | 3 | | | | | | | | | | | | | | | | | | | | | | | | |
| 11 | | | | | | | | 1 | | | 6 | | | | | | | | | | | | | | | | | | | | | | | | |
| 12 | | | | | | | | | | | | | | | | | | | | | | *R1 | | | | | | | | | | | | | * One word R, Wagon box one word |
| | | | | | | | | | | | | | | | | | | | | | | III1(6) | | 3 | | | | | | | | | | | |
| 13 | | | | | | | | | | | | | 1(5) | | | | | | | | | | | 1 | | | | | | | | | | | | |
| 14 | | | | | | | | | | | | | R | | | | | | | | | | | R | | | | | | | | | | | | |
| 15 | | | 1 | | | | | | | | 8 | | | | | | | | | | | | | | | | Dis | | | | | 3 | | | |
| 16 | | | | | | | | 1 | | | 5 | | | | | | | | | | | | | | | 1 | | | | CS | | | | | (neg |
| 17 | | | | | | | | | 2 | | 10 | | | | | | | | | | | | | | | 1 | | | | | | 10 | | | (neg |
| 18 | | | | | | | | | 1 | | 8 | | | | | | | | | | | | | | | | | | | | | 11 | | | |
| 19 | | | | | | | | 1 | | | 2 | | | | | | | | | | | | | | | | | | | | | | | | |
| 20 | | | | | | | | | | | | | | | | | | | | | | | | | 1† | | | | | | | | | | "ow!" |

## KEY TO ANALYSIS SHEET

R. No.—*Response Number.*—Each sentence is counted as a separate response. In case of an incomplete sentence the response is ended whenever there is a pause.

Time.—*Time of Day.*

*Complete Sentence.*—Each complete sentence was recorded in one of the several columns under this heading.

*Incomplete Sentences.*—Each incomplete sentence was recorded in one of the several columns under this heading.

*Non-Verbal.*—All incomprehensible remarks were checked in this column. If a remark was partly comprehensible and partly non-verbal it was recorded in the appropriate column under incomplete sentences and also checked in the non-verbal column. In this case the check in the non-verbal column was circled to avoid counting it twice and thus throwing off the total number of remarks.

*Special item V.*—The term was borrowed from Fisher and really has not been used in this study. However, the various items listed under this general heading have been used. These include most of those indicated by Fisher and some additional ones.

*Interrogative, Imperative, Declarative.*—Each response classed as either a complete or an incomplete sentence was placed under one of the above headings according to whether it was a question, command, or statement. If, as sometimes happened in the case of incomplete sentences, it was impossible to determine whether it was a question, command, or statement, it was recorded in the column marked undetermined.

I. *Self as subject of sentence.*—Those sentences in which the child himself, either singular or plural, was the subject were recorded in one of the columns headed by "I."

Examples.—"I am going out." Complete sentence, Declarative I, 1.

"May I have the doll?" Complete sentence, Question, I, 1.

II. *Other person or persons as subject.*—Sentences in which another person was subject were recorded in the appropriate column marked "II." These were, for the most part, in the second person but, when the subject was in the third person, this was indicated by a star, usually *red* or *blue.*

Examples.—"Give me the doll." Complete, Imperative, II, 1.

"Does he want —?" Incomplete, Question, II, 1.*

III. *Object or thing as subject.*—Each sentence in which the subject reference was not to a person was recorded in the appropriate column, marked "III."

In the case of incomplete sentences, the subject was classified according to the context whenever perfectly clear. When the context was not clear, the response was placed in the column headed "III" and its ambiguity indicated by a question mark—usually *red.*

Examples—"It's a big dog." Complete sentence, Declarative, III, 1.

"Gone." Unless the context makes the subject clear, Incomplete, Declarative, III, 1.?

Undet.—*Undetermined.*—Indicates that it is not possible to determine whether the response belongs under interrogative, imperative, or declarative. Roman numerals, I, II, III, used in this column—have the same significance as indicated above.

Wd. Pl.—*Word Play.*—In this category were placed all series of words strung together in meaningless fashion and jingles made up by the child. In addition all poems, songs, etc., which obviously were not the child's own words, were placed in this column but marked with a circle indicating that they were to be omitted from the regular data.

The column following No. Wds. for complete sentences has been used for *Word play* when expressed in complete sentences.

No. Wds.—*Number of words.*—The number of words in each response was counted on the basis of the rules given.

Neg. St.—*Negative Statements.*—Indicated by a figure 1 or a check mark in the column.

Em. Ton.—*Emotionally-Toned Responses.*—This includes the following:

| *Classification* | *Indicated by* |
|---|---|
| Optative | O |
| Hortatory | H |
| Imperative | I |
| Threats | T |
| Approval | A |
| Disapproval | Dis |
| Frustrations and Fears | F & F |
| Expletive | Ex |

*Yes, No.*—Each occurrence of "yes" or "no" is recorded in the appropriate column. When standing alone it is also recorded as an incomplete sentence (declarative (5) under category III unless the context indicates otherwise). When used as part of a complete sentence it is also counted as part of the sentence.

Child.—*Naming of another child.*—Each instance recorded by initial or name.

Adult.—*Naming of adult.*—Each instance recorded by initial or name.

I & C Adv.—*Interrogative and Conjunctive Adverbs.*—These are indicated by number, according to Fisher, as follows:

1. where
2. when
3. why
4. how
5. because
6. before
7. while
8. since
9. but
10. if
11. then
12. until
13. so
14. after
15. as soon as
16. than
17. or
18. whether

(In the text, these are called Conjunctions and Adverbs.)

*We, Us, Our.*—Each instance of the use of the first person plural is indicated in this column.

### *Symbols Used in Recording the Data*

*Arabic Numerals in columns headed I, II, III* indicate the various kinds of sentences (Fisher) as follows:

1. Simple.—One independent clause.

2. Complex.—One independent clause plus one or more dependent clauses.

3. Compound.—Two or more independent clauses connected by coordinate conjunction.

4. Compound-complex.—Two or more independent clauses plus one or more dependent clauses.

*Arabic Numerals in column headed I & C Adv.* see above.

*Arabic Numerals enclosed in Parentheses* appear only under incomplete sentences and indicate the various types of omissions (McCarthy modified) as follows:

1. verb
2. subject
3. preposition
4. conjunction
5. verb and subject
6. miscellaneous
7. object

*Roman numerals I, II, and III* appear in the column headed *Undet.* to indicate the subject as stated above.

The Symbol *R* placed in a separate space indicates the entire response was repeated.

The Symbol *D* indicates dramatic imitation, as imitation of sounds of animals, cars, etc. The column following Non-Verbal was used for this.

*Circles.*—All symbols referring to poems or songs recited or sung by the child are circled so that they may readily be omitted from the regular count. Check marks in the non-verbal column have also been enclosed in circles when the remarks were partly verbal and partly non-verbal, thus avoiding counting these remarks twice.

*Rules for Counting Words in Sentences* (McCarthy modified)

1. Each contraction of subject and predicate, like "It's", "We're", etc., was scored as two words.

2. Each contraction of verb and negative, like "can't", etc., was scored as a single word.

3. Hyphenated words, compound nouns, proper names, etc., were each scored as one word, such as "jungle-gym," "kiddy car" and "Miss Mitchell."

4. Each part of a verbal combination was scored as a separate word. For example, "have been playing" counted as three words.

5. "Lookit"—one word if it was used alone and if it functioned simply as "look." If it was followed by an object it was counted as the two words "look it."

6. Such combinations as "good morning," "all right," etc., were counted as one word.

# INDIVIDUAL RECORD

Name: Simon
Age: 71 months

Date: July 6, 1935

Time: 2:15–3:15

## TABLE I

NUMBER AND PER CENT OF REMARKS IN CATEGORIES I, II, AND III

| Categories | (I) | | (II) | | | | (III) | | | | Total | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | *Self Reference* | | *Second Person* | | *Third Person* | | *Thing Reference* | | *Reference Unknown* | | | |
| | *Number* | *Per cent* | *Number* | *Per cent* | *Number* | *Per cent* | *Number* | *Per cent* | *Number* | *Per cent* | *Number* | *Per cent* |
| Complete Sentences | 64 | 29.2 | 36 | 16.4 | 30 | 13.7 | 89 | 40.7 | 0 | 0 | 219 | 100. |
| Incomplete Sentences | 2 | 3.5 | 13 | 22.8 | 2 | 3.5 | 24 | 42.1 | 16 | 28.1 | 57 | 100. |
| Non-verbal Remarks | 1 | 33.3 | 0 | | 0 | | 2 | 66.7 | 0 | | 3 | 100. |
| Total | 67 | 24.0 | 49 | 17.6 | 32 | 11.5 | 115 | 41.2 | 16 | 5.7 | 279 | 100. |

Coefficient of Egocentricity $\frac{\text{Cat. I}}{\text{Cat. II} + \text{Cat. III}} = \frac{67}{212} = .31604$

Omitting III (Unknown) $\frac{67}{196} = .34184$

## TABLE II

FREQUENCY AND PER CENT OF REPETITION, DRAMATIC IMITATION, AND WORD PLAY IN TOTAL REMARKS

| *Exact Repetition* | | *Dramatic Imitation* | | *Word Play* | | *Total Responses* |
|---|---|---|---|---|---|---|
| *Number* | *Per cent* | *Number* | *Per cent* | *Number* | *Per cent* | *Number* |
| 8 | 2.9 | 6 | 2.2 | 6 | 2.2 | 279 |

## TABLE III

FREQUENCY AND PER CENT OF QUESTIONS, COMMANDS, AND STATEMENTS

| | *Questions* | | *Commands* | | *Statements* | | *Undetermined and Non-verbal* | | *Total* | |
|---|---|---|---|---|---|---|---|---|---|---|
| | *Number* | *Per cent* | *Number* | *Per cent* | *Number* | *Per cent* | *Number* | *Per cent* | *Number* | *Per cent* |
| Complete Sentences | 37 | 16.9 | 13 | 5.9 | 169 | 77.2 | ..... | ..... | 219 | 100. |
| Incomplete Sentences | 14 | 23.3 | 0 | ..... | 34 | 56.7 | 12 | 20.0 | 60 | 100. |
| Total | 51 | 18.3 | 13 | 4.7 | 203 | 72.7 | 12 | 4.3 | 279 | 100. |

Calculations according to Fisher: Questions $= \frac{37}{279} = 13.3\%$

Commands $= \frac{13}{279} = 4.7\%$

# INDIVIDUAL RECORD

Name: Simon
Age: 71 months

Date: July 6, 1935

Time: 2:15–3:15

## TABLE IV

TYPES OF RESPONSES

| | *Complete Sentences* | | *Incomplete Sentences* | | *Non-verbal Remarks* | | *Total* | |
|---|---|---|---|---|---|---|---|---|
| | *Number* | *Per cent* | *Number* | *Per cent* | *Number* | *Per cent* | *Number* | *Per cent* |
| General Responses | 216 | 78.8 | 55 | 20.1 | 3 | 1.1 | 274 | 100. |
| Word Play | 3 | 60.0 | 2 | 40.0 | ..... | ..... | 5 | 100. |
| Total | 219 | 78.5 | 57 | 20.4 | 3 | 1.1 | 279 | 100. |

## TABLE V

NUMBER AND PER CENT IN TOTAL SENTENCES OF EACH KIND OF SENTENCE

| | *Simple* | | *Complex* | | *Compound* | | *Complex-Compound* | | *Total* | |
|---|---|---|---|---|---|---|---|---|---|---|
| | *Number* | *Per cent* | *Number* | *Per cent* | *Number* | *Per cent* | *Number* | *Per cent* | *Number* | *Per cent* |
| Complete Sentences | 168 | 76.7 | 38 | 17.3 | 10 | 4.6 | 3 | 1.4 | 219 | 100. |
| Incomplete Sentences | 45 | 78.9 | 10 | 17.5 | 1 | 1.8 | 1 | 1.8 | 57 | 100. |
| Total | 213 | 77.1 | 48 | 17.4 | 11 | 4.0 | 4 | 1.5 | 276 | 100. |

## TABLE VI

NUMBER AND PER CENT OF EACH PART OF SPEECH USED

| *Part of Speech* | *Total* | *Per cent* | *Total Different Words* | *Per cent* |
|---|---|---|---|---|
| Nouns | 175 | 10.8 | 91 | 25.8 |
| Verbs | 437 | 27.0 | 102 | 28.9 |
| Adjectives | 201 | 12.4 | 43 | 12.2 |
| Adverbs | 214 | 13.2 | 52 | 14.7 |
| Pronouns | 370 | 22.9 | 26 | 7.4 |
| Conjunctions | 44 | 2.7 | 4 | 1.1 |
| Prepositions | 103 | 6.4 | 9 | 2.5 |
| Interjections | 8 | .5 | 4 | 1.1 |
| Proper Names | 60 | 3.7 | 19 | 5.4 |
| Miscellaneous | 6 | .4 | 3 | .9 |
| All | 1618 | 100.0 | 353 | 100.0 |

Ratio of total different words to total number of words used:

$$\frac{353}{1618} = .218 = 1/4.6$$

# INDIVIDUAL RECORD

Name: Simon
Age: 71 months

Date: July 6, 1935

Time: 2:15–3:15

## TABLE VII

SOCIAL INDICES

| *Negative Statements per hour* | | *Emotionally Toned Responses per hour* | | *Frequency of "Yes" Per Hour* | *Frequency of "No" Per Hour* | *Naming of Children Per Hour* | *Naming of Adults Per Hour* | *Frequency of We, Us, Our Per Hour* | *Total Remarks Per Hour* |
|---|---|---|---|---|---|---|---|---|---|
| *Number* | *Percent* | *Number* | *Percent* | | | | | | |
| 18 | 6.5 | 26 | 9.3 | 7 | 5 | 35 | 15 | 12 | 279 |

## TABLES VIII

ANALYSIS OF EMOTIONALLY TONED RESPONSES

| | *Optative* | *Hortatory* | *Imperative* | *Threats* | *Approval* | *Disapproval* | *Expletive* | *Total* |
|---|---|---|---|---|---|---|---|---|
| Number | 0 | 0 | 12 | 0 | 3 | 2 | 3 | 20 |
| Percent | 0 | 0 | 60.0 | 0 | 15.0 | 10.0 | 15.0 | 100. |

## TABLE IX

NEGATIVISM

| | *Total Number* | *Negative Reactions* | *Not Negative Reactions* | *Interpretation Doubtful* |
|---|---|---|---|---|
| Negative Statements | 18 | 3 | 13 | 2 |
| Use of "No" | 5 | 0 | 4 | 1 |
| Other Negative Responses | 2 | 0 | 0 | 2 |

## TABLE X

NUMBER OF SENSORY TERMS USED

| | *Visual* | *Other* | *Total* |
|---|---|---|---|
| Number | 0 | 15 | 15 |
| Percent in Total Responses | 0 | 5.4 | 5.4 |
| Ratio to Total Responses | 0/279 | 1/18.6 | 1/18.6 |

# INDIVIDUAL RECORD

Name: Simon
Age: 71 months

Date: July 6, 1935

Time: 2:15–3:15

## TABLE XI

NUMBER OF ACTIVITY TERMS USED

| | *Reference to* | | | |
|---|---|---|---|---|
| | *Self* | *Other Person* | *Thing* | *Total* |
| Number | 44 | 44 | 21 | 109 |
| Percent in Total Responses | 15.8 | 15.8 | 7.5 | 39.1 |
| Ratio to Total Responses | 1/6.3 | 1/6.3 | 1/13.3 | 1/2.6 |

## TABLE XII

NUMBER OF RELATIONAL TERMS USED

| | *Temporal* | *Spatial* | *Total* |
|---|---|---|---|
| Number | 30 | 127 | 157 |
| Percent in Total Responses | 10.8 | 45.5 | 56.3 |
| Ratio to Total Responses | 1/9.3 | 1/2.2 | 1/1.8 |

## TABLE XIII

INTERROGATIVE AND CONJUNCTIVE ADVERBS USED

| *Adverb* | *Times Used* | *Adverb* | *Times Used* |
|---|---|---|---|
| 1. where | 3 | 10. if | 11 |
| 2. when | 7 | 11. then | 7 |
| 3. why | 5 | 13. so | 1 |
| 4. how | 7 | 14. after | 1 |
| 5. because | 11 | 16. than | 1 |
| 9. but | 3 | | |
| | | Total | 57 |

## TABLE XIV

COMPREHENSIBLE AND NON-VERBAL RESPONSES (AVERAGE LENGTH)

| | *Number of words* | *Number of Responses* | *Average Number Words Per Response* |
|---|---|---|---|
| Comprehensible | 1613 | 276 | 5.8 |
| Non-verbal | 5 | 3 | 1.7 |
| Total | 1618 | 279 | 5.8 |

Ratio of non-verbal to comprehensible responses is 1 to .011.

# ARCHIVES OF PSYCHOLOGY

*List of numbers, continued from inside front cover*

117. Measurement of Mental Deterioration: H. Babcock. $1.25.
118. Phenomenon of Postural Persistence: L. S. Selling. $1.00.
119. American Council on Education Rating Scale: F. F. Bradshaw. $1.00.
120. Group Factor in Immediate Memory: A. Anastasi. $1.00.
121. Individual Differences in the Sense of Humor and Temperamental Differences: P. Kambouropoulou. $1.00.
122. Suggestibility in Normal and Hypnotic States: G. W. Williams. $1.00.
123. Analytical Study of the Conditioned Knee-Jerk: G. R. Wendt. $1.25.
124. Race Differences in Numerical and Verbal Abilities: J. Dunlap. $1.25.
125. Errors of Measurement and Correlation: E. E. Cureton. $1.25.
126. Experience Factors, Test and Efficiency of Women Office Workers: N. Bird. $1.00.
127. Delayed Reactions of Infants: C. N. Allen. 80c.
128. Factors Measured by the Thorndike Intelligence Examination: J. G. Peatman. $1.00.
129. Educational Success and Failure in Supernormal Children: J. Regensburg. $1.75.
130. Effect of Practice on Visual Perception of Form: J. P. Seward. $1.00.
131. Relation to College Grades of Factors other than Intelligence: D. Harris. 80c.
132. Psychological Differences Between "Racial" and National Groups: O. Klineberg. $1.00.
133. Emotional Diff. of Delinquent and Non-Delinquent Girls: A. Courthial. $1.25.
134. Learning and Retention of Pleasant and Unpleasant Activities: H. Cason. $1.25.
135. Investigation of Brightness Constancy: R. B. MacLeod. $1.25.
136. The Rorschach Test Applied to Feeble-Minded Group: S. J. Beck. $1.00.
137. Retention after Intervals of Sleep and of Waking: E. B. van Ormer. $1.00.
138. Stimulus Temperature and Thermal Sensation: F. Heiser. $1.00.
139. Energy Cost Measurements on Curve of Work: H. J. Schubert. $1.00.
140. Technique for the Measurements of Attitudes: R. Likert. 80c.
141. Speed Factor in Mental Tests: P. H. DuBois. 80c.
142. Further Studies on the Memory Factor: A. Anastasi. $1.00.
143. An Experimental Study on Variability of Learning: S. E. Asch. $1.00.
144. Inventory for Measurement of Inferiority Feelings. R. B. Smith. $1.50.
145. The Psychological Effects of Oxygen Deprivation: R. A. MacFarland. $1.50.
146. Relation of Subliminal to Supraliminal Learning: O. A. Simley. 80c.
147. Effects of Noise upon Certain Psychological Processes: F. L. Harmon. $1.25.
148. Conditioned Responses in Children: G. S. Razran. $1.50.
149. Resemblance of Parents and Children in Intelligence: M. C. Outhit. $1.00.
150. Influence of Oral Propaganda Material upon Attitudes: K-C. Chen. 80c.
151. Negative or Withdrawal Attitude: H. Pallister. 80c.
152. Judgment in Absolute Units as a Psychophysical Method: J. Bressler. $1.00.
153. Visual Illusions in the Chick: C. N. Winslow. $1.25.
154. Measuring Teaching Efficiency Among College Instructors: G. W. Hartmann. 80c.
155. Psychogalvanic Responses in Arithmetical Work: R. Sears. $1.00.
156. Group Factors in Mental Tests: M. Smith. $1.00.
157. . . . Brightness Discrimination Habit in the Chick: A. B. Wood. 80c.
158. Accuracy of perception of visual musical stimuli: A. Roe. $1.00.
159. Effect of Practice Upon Individual Differences: R. E. Perl. $1.00.
160. Antagonistic Muscle Action During the Initiatory Stages: D. J. Wilson. $1.00.
161. Verbal, Numerical and Spatial Abilities of Young Children: B. Schiller. $1.00.
162. Organization of Memory in Young Children: A. I. Bryan. $1.00.
163. Self-Estimates of Improvement in Repeated Tasks: N. Kneeland. $1.25.
164. Biochemical Study of the Metabolism of Mental Work: H. Goldstein. $1.00.
165. Attitudes and Unemployment: O. M. Hall. $1.00.
166. Change of Socio-Economic Attitudes under Motion Picture Propaganda: S. P. Rosenthal. 80c.
167. Methodology of the Digit-Span Test: J. G. Peatman & N. M. Locke. 80c.
168. Effect of Repetition on Reactions to Electric Shock: J. & G. Seward. $1.50.
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